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IRON TRADE REVIEW

Registration Applied for

Published Weekly
VOL. LXXI. No. 22

CLEVELAND, O., NOVEMBER 30, 1922
Entered as second-class matter at the post-office in Cleveland, Ohio, under the act of March 3, 1879

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SHEET AND TIN PLATE MILL FURNACE EQUIPMENT
HAGAN ANNEALING FURNACES
STANDARDIZED HEAT TREATING FURNACES
STANDARDIZED ELECTRIC HEAT TREATING FURNACES
THE HAGAN GAS PRODUCER
INDUSTRIAL FURNACES
HAGAN
FOR ALL PURPOSES
LIQUID FUEL BURNERS FOR THE GENERATION OF STEAM
AUXILIARY APPARATUS FOR LIQUID FUELS
LIQUID FUEL BURNERS FOR OPEN HEARTH AND OTHER REGENERATIVE FURNACES

WRITE FOR BULLETINS

The Geo. J. HAGAN Company,

People's Bank Building, Pittsburgh, Pa.

The Koppers Company's New Oven

Fifteen Years Ago—the by-product coke oven industry received an impetus from the introduction of a new oven that has carried it from comparative obscurity to a point where it is now recognized as one of the basic industries of the country.

Through its development, coal products worth billions of dollars have been saved and utilized for the benefit of the nation, creating new industries and broadening the scope of others.

The part played by the Koppers Company in this development is best expressed by the fact that out of a total of 9300 ovens built in the United States and Canada since 1908, when the first Koppers Ovens were built, 7196 or 88%, have been designed and built by this company.

Today—the Koppers Company's New Oven gives an even greater conception of the benefits to be derived from the by-product coke oven, establishing a standard of performance that far excels anything heretofore attained.

There are now built or building 408 ovens of this new design, as follows:

Chicago By-Product Coke Co., Chicago, Ill. . . .	5
Carnegie Steel Co., Clairton, Pa.	366
Weirton Steel Co., Weirton, W. Va.	37
Total	408

The Koppers Company

PITTSBURGH, PA.

IRON TRADE REVIEW
Registration Applied For
The Authority of Industry — National and International
Vol. LXXI — Cleveland, O., November 30, 1922 — No. 22

Buying for 1923 Is More Active

Automobile Industry, Planning for Big Year, Freely Negotiating Requirements—General Motors Corp. in Market for Large Tonnage—Canmaker Places 1,000,000 Boxes of Tin Plate—Steel Production Well Maintained

BUYERS of iron and steel more earnestly are taking up future requirements and the covering movement for first quarter is beginning to gather momentum. Automobile and accessory manufacturers who are planning for a big year in 1923 are prominent in the market. The General Motors Corp. is negotiating for its first quarter requirements estimated at better than 200,000 tons which includes 80,000 tons of bar mill products at Chicago. The Ford Motor Co. now producing 5200 cars daily is planning for 6000 cars daily by March 1. Other automobile companies are preparing schedules accordingly. Some will take in the first quarter of 1923 double the tonnage of full finished sheets required the last three months of this year. Other lines of manufacture are seeking future tonnage including farming implement, nut, bolt and rivet producers.

Unchanged prices for sheets and tin plate for first quarter announced by the American Sheet & Tin Plate Co. which have been adopted by independent mills have brought about considerable new buying though the leading producer has many of its customers well covered for that period. A leading can maker has placed 1,000,000 boxes of tin plate.

Iron and steel production is well maintained around 80 per cent of capacity which is about as far as various makers hope to go in view of winter difficulties. Traffic conditions are not greatly changed.

Another drop in IRON TRADE REVIEW composite of fourteen iron and steel products to $41.40 is registered this week. This makes the tenth consecutive weekly decline. Last week the composite was $41.78 and for all November $42.08.

Car Plants Filled Up

An order for 7500 cars placed by the St. Paul road is the largest of its kind in some weeks and the Pere Marquette closed for 2000 but a great number of equipment inquiries remains unsettled and more requests for bids are coming out constantly. One chief cause for the delay in the placing of car orders is the filled-up condition of builders' plants. Chicago reports only two car plants able to give deliveries before June, 1923.

Building work is better prolonged than usual for this season with a sizable volume of new work being initiated. Awards this week were 10,000 tons. Bids soon are to be taken for a bridge at Seattle requiring 11,000 to 12,000 tons. The McClintic-Marshall Co. is low on a 6500-ton bridge at Pittsburgh.

Some Prices Easier

Despite the heavy tonnages required for freight car construction and the continuing demands from the oil industry, the volume in plates is not sufficient to fill capacity and keen competition is bringing divergent prices. The open figure of 2.00c, Pittsburgh, is being shaded to 1.90c and lower for attractive tonnages. For Pacific coast 1.75c has been named. The Standard Oil Co. of Indiana placed 40 tanks requiring 12,000 tons and the Texas Co. 20 tanks, about 4000 tons. Many other tanks are in the market including about 10,000 tons for California oil companies. Two California pipe lines call for 10,400 tons. Despite the weakness in plates, bars and structural shape prices are steady. Black sheets remain soft.

Pig iron buying for first quarter is expanding but the volume still is far below expectations. More buyers, some of them of the larger class, are opening negotiations however. With larger sales has come a further yielding of prices. Buffalo especially has exhibited weakness, with quotations as low as $25 base. The effect of such offering has been to unsettle the eastern Pennsylvania market where $27 furnace and less has been done. Alabama iron now has been quoted at $22. Chicago iron has gone to $29 and valley to $26. The General Motors Corp. is reported to have closed on an inquiry for 18,000 tons.

Lose Export Tonnage

Pittsburgh fabricators who bid on 30,000 tons of electric transmission towers for the South African railways probably will lose this business to British competitors who have underbid them about $13.50 per ton delivered Capetown. An order for 150.000 boxes of tin plate for the Standard Oil Co. of New Jersey recently offered to American mills also has gone to Welsh makers at about $4.41 per base box. Special freight concessions by British shipowners figured in this transaction.

Business Trend and Chart Section Page 1477

IRON TRADE REVIEW

Registration Applied For

The Authority of Industry National and International

Published Every Thursday by

THE PENTON PUBLISHING CO., CLEVELAND, O.

Member, Audit Bureau of Circulations, Associated Business Papers, Inc., and National Publishers Association

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BIRMINGHAM, ENG. - - - - - - - Prince's Chambers
LONDON, ENG. - 2-3 Caxton House, Westminster, S. W. 1.
PARIS, FRANCE - - - - - - - - 224 Rue de Rivoli

Cable Address, IROTRAPEN, London

Subscription, United States, Cuba and Mexico, $6 per year. Canada and other Foreign Countries, $8.50 per year.
Entered at the Postoffice at Cleveland as Second Class Matter

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Independent Merger Nears Reality

INNUMERABLE columns of newspaper space having prepared it for such an event, the country finds itself witnessing, if not the completion at least the far advancement of a combination of independent steel companies worthy of the name, through the unexpected announcement this week of the acquisition by the Bethlehem Steel Corp. of the Midvale interests. Following within a comparatively few weeks the purchase of the Lackawanna Steel Co. by the Bethlehem Steel Corp., this latest development represents actually the consolidation of three of the leading independent units of the country. Carried back further before the Midvale Steel & Ordnance Co. was formed in 1915 by the combination of four steel companies and before the Bethlehem company acquired the Pennsylvania and Maryland Steel companies in 1916, and the American Iron & Steel Mfg. Co., the Baltimore Sheet & Tin Plate Co., and other properties at various times, actually it stands forth as the amalgamation of no less than seven or eight distinct operating steel organizations.

The size of the Bethlehem Steel Corp. as enlarged by this latest purchase emphasizes the major importance of this event to the iron and steel industry of the country. The Bethlehem combination will have an annual capacity of approximately 6,300,000 tons of pig iron, 7,500,000 tons of steel ingots and 6,400,000 tons of finished rolled products. This means substantially one-third of the magnitude of the Steel corporation.

Clearly the underlying purpose of the repeated efforts to merge independent works, of which various examples have been seen in recent years and especially under the trying conditions of the past twelve months or so, is to put these properties nearer to an equality of competition with the Steel corporation plants. Neither the Lackawanna Steel Co. nor the Midvale Steel & Ordnance Co. have proved their ability to earn adequately on their capitalization under the operating and market conditions recently prevailing and which are likely to continue for an indefinite period. On the other hand the Bethlehem Steel Corp., with a widely diversified line of products, thoroughly integrated on raw material resources, and under highly capable management, has been uniformly successful.

With all its impressive size, however, the new combination still patently is lacking in a geographical sense to make it a truly national independent steel organization. As it now stands, it is still virtually an eastern proposition. The Cambria plant at Johnstown gives it important representation in the Pittsburgh district but this is its farthest western point of operations. Manifestly, it is at a marked disadvantage for competing in the Chicago and much of the great middle western market which is the densest consuming territory of steel in the country. Furthermore, while possessing great capacity in rails, plates, structural shapes and merchant bars, it is of mediocre strength in tin plate and wire products, weak in sheets and is practically out of the tubular goods market.

This situation points the way that the continued expansion of the Bethlehem corporation is destined to take. The development of its operations has reached the stage where there can be no mistaking its ultimate purpose to create a grouping of independent plants along lines of national distribution paralleling that of the Steel corporation. In fact, ruling conditions of competition seem likely to hasten the objective of a rounded out corporation, geographically, as well as in scale and scope of production.

Traffic Reflects Trade Change

AFTER experiencing a most remarkable autumn expansion general business now is beginning to settle down to a more settled pace for the winter months. The continued gains in operations of the iron and steel industry, and the unusually small curtailment of activities in

building and in automobiles indicated that the letdown this year may be less general and pronounced than usually is the case.

That the lull is at hand, however, is indicated by the declines in car loadings, which constitute one of the most accurate measures of current trade. The peak of the country's traffic usually comes between the middle and the close of October. This was what happened this year. The high water mark of car loadings was reached during the week ended Oct. 28, with a total of 1,014,480. That figure exceeded only one previous occasion in the history of the country, during the week ended Oct. 14, 1920, when the total was 1,018,818. Since the last week in October there has been a steady drop in traffic. For the week ended Nov. 11 the number of cars loaded with revenue freight was 953,909. This was 60,500 less than the high figure two weeks previously.

As they stand, current car loading records are without parallel for the season. The total for the week ended Nov. 11 was 198,132 cars higher than the same week in 1921 and 26,000 higher than in 1920. Moreover loadings of merchandise and miscellaneous freight were the highest ever known. With the decline in loadings, the car shortage problem is becoming less acute. From the peak of 179,000 cars daily, the total had dropped 26,000 cars on Nov. 15. This development should favor better operations at steel works at least until traffic movements become impaired by inclement winter weather.

Aid the Water Power Commission

RECURRING miners' strikes, the increasing burden of coal transportation and the advisability of conserving the supply of high-grade coal—to cite only three major reasons—emphasize the necessity of developing our waterpower resources. A step in advance was taken in 1920 by the enactment of the federal waterpower act but the parsimony of congress, contrasted with its liberality in other directions, has almost proved nullifying.

The commission itself is only a part-time affair, since it comprises the secretary of war, who acts as chairman, and the secretaries of interior and agriculture. The stress of other burdens detracts from the attention the commission's activities should receive from these secretaries. In addition to the commission, the waterpower act authorizes the hiring only of an executive secretary and an engineer.

The actual working force of the commission, in addition to these two authorized officers, consists of 18 clerks, eight engineers, two attorneys and two accountants, all them borrowed from the other departments. There is no field force, loaned or otherwise, and for reports and the conduct of field hearings the commission must rely upon the field officers of other departments.

Considering that the federal trade commission, for example, is able to persuade congress to grant it between $900,000 and $1,000,000 annually, the $100,000 allotted to the federal waterpower commission is pitiably meager. Here is a constructive work of the first order, yet it is starved by congress. The development of waterpower resources is certain to assume increasing importance each year and the government should control the situation before it gets out of hand. It should be easy for congress to pare the budgets of government departments and other commissions and grant the waterpower commission an appropriation more in keeping with the great work that has been cut out for it.

Builders Disregard Weather Handicap

CARRYING construction activity into the winter season instead of stopping such work at the advent of freezing temperatures is an important development of recent years. Means have been developed for protecting concrete work against the action of frost to such a degree that scarcely a check has been noted this fall and the winter is opening with an unprecedented volume of construction under way. In many cities, the steelwork for office and industrial buildings is being erected in spite of freezing weather. Not only is there much under way but prospective building is being planned for immediate undertaking regardless of weather conditions.

The effect of this on the steel industry is to balance demand for structural shapes and also for bars used in reinforcing. Instead of cutting off deliveries at the beginning of winter as in the past, with an accumulated demand in the spring the present tendency is to continue deliveries through the winter and thus relieve pressure early next year.

This is an important contribution to stabilization of the industry by minimizing a peak and valley of demand, giving mills a better opportunity to keep deliveries even through the year. Even though a cessation may be met in the severest cold, yet, the situation is much bettered by shortening the period of idleness.

The effect on labor is also better as the usual idle period has been reduced and almost eliminated, so that building crafts have a much longer work year and as a result better earnings and less loafing time.

Never before has the period of construction been carried so far toward winter without abatement and indications are the usual falling off of demand will be pushed at least 60 days later, while it is probable resumption in the spring will be much earlier than usual.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

November 29, 1922	November 22, 1922	October, 1922	August, 1922	November, 1921	November, 1913
$41.40	$41.78	$43.60	$39.79	$34.71	$24.02

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Composite Market Record by Months for Nine Years on Page 1526

SCRAP PRICES, PAGE 1524, WAREHOUSE, PAGE 1516, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1520

Iron and Steel Prices

Pig Iron

Bessemer, valley	$31.00
Bessemer, Pittsburgh	32.77
Basic, valley	26.00 to 27.00
Basic, Pittsburgh	27.77 to 28.77
Basic, Buffalo	26.50
Basic del., eastern Pa.	27.50 to 28.00
Malleable, valley	28.00
Malleable, Pittsburgh	29.77
Malleable, Chicago	29.00 to 30.00
Malleable, Buffalo, furnace	25.50 to 26.50
Malleable, del., eastern Pa.	28.00 to 29.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	30.13 to 31.26
No. 1X, Buffalo	27.25
No. 2 foundry, valley	27.00
No. 2 foundry, Pittsburgh	28.77
No. 2 foundry, Buffalo	25.50 to 26.00
No. 2 foundry, Chicago	29.00 to 30.00
No. 2 foundry, Granite City	31.00 to 32.00
No. 2 foundry, Ironton furnace	28.00 to 29.00
No. 2 foundry, Cleveland del.	29.50 to 30.00
No. 2 foundry, del., Phila.	28.13 to 29.26
No. 2 foundry, N. J. tidewater	28.28 to 29.26
No. 2X, eastern del., Phila.	29.13 to 30.26
No. 2X, east. N. J. tidewater	29.28 to 30.26
No. 2X, eastern del. Boston	31.65 to 32.65
No. 2X foundry, Buffalo fur.	25.50 to 26.50
No. 2X, Buffalo del. Boston	31.41 to 32.91
No. 2 southern, Birmingham	23.00 to 24.00
No. 2 southern, Cincinnati	27.05 to 28.05
No. 2 southern, Chicago	28.01 to 29.01
No. 2 southern, Philadelphia	30.80 to 31.80
No. 2 southern, Cleveland	29.01 to 30.01
No. 2 southern, Boston (rail)	32.61 to 33.61
No. 2 southern, St. Louis	28.17 to 30.17
No. 2X, Virginia furnace	28.50
No. 2X, Virginia Phila.	33.67
No. 2X, Virginia Jersey City	34.04
No. 2X, Virginia Boston	34.42
Gray forge, eastern Pa.	27.00 to 28.00
Gray forge, val. del. Pitts.	28.27
Low phos., standard, valley	36.00 to 37.00
Low phos., standard, Phila.	Nominal
Low phos., Lebanon furnace	35.00
†Low phos. British tidewater	28.00 to 29.00
Charcoal, Birmingham	32.00 to 33.00
Charcoal, Superior, Chicago	36.15
Silvery Iron	
Jackson County, Ohio, furnace	
8 to 9 per cent	$37.50
9 to 10 per cent	39.50
10 to 11 per cent	41.50
11 to 12 per cent	44.80
12 to 13 per cent	48.10
Bessemer Ferrosilicon	
Jackson County, Ohio, furnace	
10 to 11 per cent	$46.50
11 to 12 per cent	49.80

Ferroalloys

Ferromanganese, 78 to 82 per cent domestic, f.o.b. furnace	$100.00
Ferromanganese, delivered, Pittsburgh	104.79 to 104.91
†Ferromanganese, 79 per cent, English, c.i.f. Atlantic port	100.00 to 100.68
Spiegel, 19 to 21 per cent furnace spot nominal	36.00 to 37.00
†Spiegel, 20 per cent English, c.i.f. Atlantic port	36.50
Ferrosilicon, 50 per cent contract freight allowed	80.00 to 82.00
Ferrotungsten, standard, per pound contained	92.00 to 94.00
†Duty paid.	
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	13.00c to 14.00c
Imported ferrochrome, 4 to 6 per cent carbon	12.00c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens	
Connellsville furnace	$6.75 to 7.25
Connellsville foundry	7.50 to 8.00
Pocahontas furnace	nominal
Pocahontas foundry	nominal
New River furnace	9.00 to 10.00
New River foundry	12.00
Wise county furnace	7.00 to 7.50
Wise county foundry	8.50 to 9.00
Alabama furnace	7.00 to 8.00
Alabama foundry	7.50 to 8.50
By-Product	
Foundry, Newark, N. J., del.	$12.84 to 12.91
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill., ovens	14.00
Foundry, Alabama	8.50 to 9.00

Semifinished Material

BILLETS AND BLOOMS (4 x 4-inch)	
Open-hearth, Pittsburgh	$38.00
Open-hearth, Youngstown	38.00
Open-hearth, Philadelphia	43.17 to 45.17
Bessemer, Pittsburgh	38.00
Bessemer, Youngstown	38.00
Forging, Pittsburgh	42.50 to 47.50
Forging, Philadelphia	50.17
SHEET BARS	
Open-hearth, Pittsburgh	$38.00
Open-hearth, Youngstown	38.00
Bessemer, Pittsburgh	38.00
Bessemer, Youngstown	38.00
SLABS	
Pittsburgh and Youngstown	38.00
WIRE RODS AND SKELP	
Wire rods, Pittsburgh	$47.50 to 50.00
Grooved skelp, Pittsburgh	2.00c to 2.10c
Universal skelp, Pittsburgh	2.00c to 2.10c
Sheared skelp, Pittsburgh	2.00c to 2.10c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c
Structural shapes, Phila.	2.225c to 2.325c
Structural shapes, New York	2.24c to 2.34c
Structural shapes, Chicago	2.10c to 2.20c
Tank plates, Pittsburgh	1.95c to 2.00c
Tank plates, Philadelphia	2.225c to 2.325c
Tank plates, New York	2.24c to 2.34c
Tank plates, Chicago	2.10c to 2.30c
Bars, soft steel, Pittsburgh	2.00c
Bars, soft steel, Phalidelphia	2.325c
Bars, soft steel, New York	2.34c
Bars, soft steel, Chicago	2.00c to 2.10c
Bars, forging, Pittsburgh	2.60c to 2.75c
Bars, rail steel, Chicago	2.00c
Reinforcing bars, Pittsburgh	1.95c to 2.00c
Bar iron, common, Phila.	2.275c to 2.325c
Bar iron, common, New York	2.29c to 2.34c
Bar iron, common, Chicago	2.50c

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.90c
Bands, Pittsburgh	2.90c
Cotton ties, per bundle Pitts.	$1.14
Cold finished steel bars, Pittsburgh base	2.50c
Steel shafting	2.50c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 31.50
Relaying rails, Pittsburgh	28.00 to 32.00
Light rails, 25 to 45, mill	2.00c to 2.15c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.75c to 2.85c
Spikes, small and boat Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	2.85c to 3.00c
Track bolts, Pittsburgh	3.85c to 4.50c
Track bolts, Chicago	3.85c to 4.00c
Tie plates, Pittsburgh	2.35c to 2.50c
Tie plates, Chicago	2.35c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.70c
Plain and annealed wire, Pitts.	2.45c
Galvanized wire, Pittsburgh	2.95c
Barbed wire, painted, Pitts.	2.85c
Barbed wire, galv., Pittsburgh	3.35c
Polished staples, Pittsburgh	2.85c
Galvanized staples, Pittsburgh	3.35c
Coated nails, count keg, Pitts.	2.20c
Woven wire fencing (retailers)	68 off
Woven wire fencing (jobbers)	70½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.00c to 2.05c
Hot rolled strip steel, Pittsburgh stamping quality	2.90c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.50c

Sheets

SHEET MILL BLACK	
No. 28, open-hearth, Pittsburgh	3.25c to 3.35c
No. 28, bessemer, Pittsburgh	3.25c to 3.35c
No. 28, open-hearth, Phila.	3.675c to 3.825c
No. 28, open-hearth, Chicago	3.59c to 3.69c
TIN MILL BLACK	
No. 28, open-hearth, Pittsburgh	3.35c
No. 28, open-hearth, Chicago	3.69c
GALVANIZED	
No. 28, open-hearth, Pittsburgh	4.35c
No. 28, bessemer, Pittsburgh	4.35c
No. 28, open-hearth, Phila.	4.675c
No. 28, open-hearth, Chicago	4.64c to 4.69c
BLUE ANNEALED	
No. 10, open-hearth, Pittsburgh	2.50c
No. 10, bessemer, Pittsburgh	2.50c
No. 10, open-hearth, Phila.	2.825c to 3.075c
No. 10, open-hearth, Chicago	2.84c to 2.89c
AUTOMOBILE SHEETS	
No. 22 Pittsburgh	4.70c to 5.00c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	66	54½
1 to 1½-inch, butt iron	34	19

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c.	48 off
Charcoal iron, 3¼ to 4½ inches l. c. l.	16 off
Seamless, hot rolled, 3¼ to 4-in., l. c. l.	43 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$55.20 to 56.20
Six-inch and over, Chicago	51.20 to 52.20
Four-inch, New York	60.30
Six-inch and over, New York	55.30
Four-inch, Birmingham	47.50 to 48.00
Six-inch and over, Birmingham	43.00 to 43.50
Three-inch, Birmingham	56.50 to 57.00

Class A pipe is $4 higher than Class B.

Standard fittings, Birmingham, base, $110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Nov. 29, 1922	Oct. 1922	Aug. 1922	Nov. 1921
PIG IRON				
Bessemer, valley , del., Pitts....	$32.77	$35.12	$29.16	$21.96
Basic valley	26.50	30.60	26.00	19.00
*No. 2 foundry, del., Pittsburgh.	28.77	33.62	32.76	22.81
*No. 2 foundry, Chicago	30.00	31.75	28.60	21.00
Lake Superior charcoal, Chicago.	36.15	36.15	33.75	32.25
Malleable, valley	28.00	34.62	28.60	20.00
Malleable, Chicago	30.00	31.75	28.60	21.00
*Southern No. 2, Birmingham.	23.00	27.40	20.70	18.25
*Southern Ohio, No. 2, Ironton..	28.00	32.40	27.00	20.50
Basic eastern del., eastern Pa..	27.65	30.25	29.50	20.90
**No. 2X, Virginia furnace	28.50	33.00	26.00	22.80
**No. 2X, eastern del. Phila.....	29.50	33.00	32.15	22.50
Gray forge val. del., Pittsburgh.	28.27	33.27	30.16	21.96
Ferromanganese, del., Pittsburgh	104.91	105.47	72.29	60.00
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh.	38.00	39.85	35.00	30.00
Sheet bars, open-hearth, Pittsburgh	38.00	39.85	35.00	30.00
Billets, bessemer, Pittsburgh.....	38.00	40.00	35.00	29.00
Billets, open-hearth, Pittsburgh...	38.00	40.00	35.00	29.00
FINISHED MATERIAL—				
Steel bars, Pittsburgh	2.00	2.00	1.80	1.55
Steel bars, Chicago	2.00	2.00	1.88	1.68
Steel bars, Philadelphia	2.275	2.325	2.275	1.90

*1.75 to 2.25 silicon

	Nov. 29, 1922	Oct. 1922	Aug. 1922	Nov. 1921
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.275	$2.325	$2.125	$1.90
Iron bars, Chicago mills.....	2.50	2.50	1.98	1.70
Beams, Pittsburgh	2.00	2.00	1.80	1.60
Beams, Philadelphia	2.275	2.325	2.325	1.90
Beams, Chicago	2.10	2.10	1.90	1.68
Tank plates, Pittsburgh	1.95	2.05	1.80	1.55
Tank plates, Philadelphia	2.275	2.425	2.325	1.90
Tank plates, Chicago.....	2.10	2.10	1.90	1.68
Sheets, blk., No. 28, Pittsburgh.	3.25	3.50	3.25	2.95
Sheets, blue anl., No. 10, Pitts..	2.60	2.60	2.45	2.40
Sheets, galv., No. 28, Pittsburgh	4.35	4.50	4.25	3.95
Wire nails, Pittsburgh	2.70	2.70	2.40	2.90
COKE—				
Connellsville furnace, ovens	6.75	10.60	13.20	3.15
Connellsville foundry, ovens	7.50	12.10	14.30	4.30
OLD MATERIAL—				
Heavy melting steel, Pittsburgh.	20.50	21.35	17.10	14.25
Heavy melting steel, east. Pa..	16.00	18.00	15.25	12.60
Heavy melting steel, Chicago....	17.00	18.50	15.80	12.40
No. 1 wrought, eastern Pa.....	19.00	22.50	18.25	16.50
No. 1 wrought, Chicago.....	17.50	20.40	16.35	13.70
Rails for rolling, Chicago.....	18.00	20.50	16.75	13.90

**2.25 to 2.75 silicon

Prices Dip as Iron Buying Grows

Buffalo Offers Down to $25, Alabama to $22 and Valley to $26—Eastern Pennsylvania Market Unsettled—Inquiry and Sales Broaden—General Motors Corp. Reported To Have Placed 18,000 Tons—General Electric Co. Inquires

Philadelphia, Nov. 28.—A demoralized price situation featured the eastern pig iron market the past week. The market since has stiffened in some directions but the weakness has not entirely disappeared. Prices done on foundry ranged from $27 to $28 furnace for No. 2 plain (1.75 to 2.25 silicon) plus $1 silicon differentials. In one instance $27 furnace was shaded. Now most makers call the minimum $28 or $27.50 but $27 has not entirely disappeared. One maker which quoted the lower price now is out of the market saying its output is disposed of for four months ahead. Buffalo foundry now is offered in this district at $25 base Buffalo plus 50 cents silicon differentials. Virginia foundry is offered at $28 base furnace plus 50 cent differentials. Eastern Pennsylvania malleable was sold in the week on a shipment to New England, at $27 furnace. Gray forge is obtainable at $26 eastern furnace. The total business of the week was large. The Westinghouse Electric & Mfg. Co. is inquiring for 1000 to 2000 tons of foundry, the Union Radiator Co. for a large block, the Eastern Malleable Iron Co. for 1000 tons of malleable for Wilmington and the Richardson & Boynton Co., Dover, N. J., for 2000 to 3000 tons. Considerable tonnage was bought by pipe companies and the latter continue in the market. The recent Pennsylvania railroad purchased involved more than 8000 tons distributed between an eastern and central Pennsylvania furnace. A Worcester, Mass., consumer is inquiring for 3000 tons of copper-free low phosphorus. Domestic low phosphorus is nominal. Foreign low phosphorus is $28 to $29 duty paid.

Lower Prices Done in East

New York, Nov. 28.—Under the stress of competition for a number of orders involving 500 to 1000 tons each, prices on pig iron have declined materially during the past week. Most of this business originated in New England, where the lower prices became apparent on Buffalo iron and then extended to eastern Pennsylvania iron. The current market on Buffalo iron is regarded at $26, base furnace, and shading of this figure is reported. Furthermore, silicon differentials are not as high as they were, or they are being disregarded entirely. New business during the past week has shown some improvement and the total is in excess of 10,000 tons. Nearly all of this iron is for prompt and nearby shipment.

Foreign iron is more difficult to sell. The only new sales involve tonnage for spot arrival. The current business is going at around $26 to $27, duty paid, tidewater, for English and continental grades. Scotch iron now may be had at $27 to $27.50, duty paid, tidewater, for any delivery. The General Electric Co. is inquiring for a big tonnage.

Foreign and Domestic Clash

Boston, Nov. 28.—The fight between foreign and domestic irons for New England business still is being waged with the result that delivered prices have dropped $2 during the past week. Buffalo iron has been quoted at $25 base, furnace, or $29.91 delivered. Eastern Pennsylvania furnaces have come into the market with a $27 base furnace price which means $30.65 delivered New England, and in most cases the differentials are being shaded.

A Springfield, Mass., manufacturer, against an inquiry for 1000 tons, received bids from Buffalo and eastern

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Pennsylvania furnaces in line with those above quoted, and then placed his order for foreign iron at a lower figure. Scotch iron is offered at $27 c.i.f. Boston. Sales during the past week totalled approximately 5000 tons in addition to several thousand tons of low phosphorus. A textile machine manufacturer bought 500 tons of Buffalo iron and 500 tons of foreign iron. A Connecticut consumer and two Massachusetts consumers each bought 500 tons of domestic iron. Miscellaneous small sales of foreign iron totalling between 1500 and 2000 tons are reported. The low phosphorus sale was foreign iron at a base price below $35 c.i.f.

Buying Still Limited

Chicago, Nov. 28.—Greater interest is shown in the pig iron market, but there is not much buying except for prompt shipment. Small lots of southern iron are coming in and buyers are taking relatively more tonnage. Northern makers are meeting competition with $29, Chicago furnace, for the first quarter, and $30 for prompt lots in competing outside the Chicago territory. They are selling at lower figures at the furnace for delivery in this territory. Sellers believe heavy buying is just ahead and anticipate a deluge when it starts. It is not believed melters will continue the hand-to-mouth buying into the new year.

The minimum quoted on southern iron is $22. Some sales have been made at $23, while other makers are not quoting. It is understood the General Motor Corp., has placed 18,000 tons for Saginaw and other Michigan plants with eastern makers. A southern Wisconsin melter has taken 400 tons of foundry iron at $29, delivered, for the first quarter, while a northern Illinois buyer has closed for 1000 tons of foundry iron at the same price and for the same delivery. An Illinois stovemaker is asking for prices on 1000 tons of foundry iron for the first quarter. A Chicago manufacturer is asking for 500 tons of foundry iron for prompt delivery. A steelmaker wants 1000 tons of low phosphorus iron and 300 tons of bessemer ferrosilicon. The sale of 200 tons of silvery iron to a Chicago user is reported. The market for silveries is quiet, at $37.50 Jackson county furnace, for the 8 per cent quality.

Basic Manifests More Strength

Pittsburgh, Nov. 28.—Whether or not the turn has come in the pig iron market remains to be seen, but basic is stronger this week than during the latter part of last week when a sale of 250 tons was consummated at $26, valley. A buyer entering the market yesterday for 500 tons paid $27, valley, after a thorough canvass of the situation and that represents the quotable market today with but little iron available, particularly in the Mahoning valley district. What the Allegheny Steel Co. will be able to do on its inquiry for 3000 to 5000 tons or 5000 to 10,000 tons, is not as yet clear although it is reported to have a quotation of $26, valley. No. 2 foundry is practically the only other active grade but many consumers still are buying iron on a hand-to-mouth basis. Several consumers, however, are quietly sounding

Extended statistics of American iron and steel production, composite market average, and freight rates, page 1526

out the market as to first quarter prices. Makers claim they will be governed in making such quotations by the tonnage involved and various other conditions but at the present time they are quoting $27, valley. One buyer within the past few days was able to shade that price 25 cents on 400 or 500 tons. One sale of 500 tons and another of 200 tons of No. 1 foundry are noted at $28, valley; several sales involving 250 to 500 tons of No. 3 foundry iron went at $27, valley; and one car wheel manufacturer bought No. 3 grade at $27, f.o.b. Pennsylvania furnace with the same freight rate to Pittsburgh as from the valley. Malleable is quoted at $29, valley. Two or three carloads of resale bessemer have been sold at $29, valley, by a middle interest. In competition with such offers, however, producers have sold additional single carloads at $31, valley. This is 50 cents lower than a week ago. Low phosphorus copper-free iron still is quoted at $36 and $37, valley, with no sizable sales or inquiries noted. The car supply is somewhat easier in certain directions while in others it is on a 20 or 25 per cent basis.

Southern Ohio Iron Lower

Cincinnati, Nov. 28.—Southern Ohio pig iron has sold on a $28 base, Ironton, one lot of 1000 tons being booked a few days ago by a Cincinnati seller for an Ohio consumer for delivery this year. Indications are that fractionally under that price has been done, but a spread from $28 to $29 is quoted by furnaces, a decline of $1 since a week ago. Consumers of southern iron continue their efforts to get prices down by offering tonnages under the present $23 base and withholding orders. The claim is made by some of these that iron is available in the Alabama district at $22 but so far as can be learned no furnace has offered any tonnage.

Ohio silvery iron has declined another $2 a ton, the Jackson county furnaces having put out a new schedule effective at once under which the following prices are quoted: 8 per cent, $37.50, 9 per cent, $39.50, 10 per cent, $41.50, 11 per cent, $44, and 12 per cent, $46.50. The following prices are quoted on bessemer ferrosilicon: 10 per cent, $46.50 and 11 per cent, $49.80.

Increased sales are reported in all quarters during the past week, the movement, in the main, however, being in small lots. A round lot of 500 tons of northern foundry has been taken by a southern Ohio melter for prompt delivery; a Dayton consumer bought 200 tons; 100 tons went to a Cincinnati consumers and nearby melters entered orders for 400, 300, 250 and 100 tons of southern foundry, respectively. A local dealer booked an order for 100 tons of foreign low phosphorus iron and 400 tons of malleable was sold for first quarter delivery in Ohio. A moderate improvement is shown in inquiry. The Williamson Heating Co., Cincinnati, is taking bids on 2000 to 2500 tons of southern foundry and an important Ohio consumer is in the market for 1000 tons of northern foundry for first quarter. Another interest has asked for bids on 2500 tons for first half and also will consider offers for half that tonnage for first quarter. A melter at Knoxville, Tenn., will buy 400 tons of southern foundry.

Sellers More Cautious

Cleveland, Nov. 28.—The increasing interest of buyers in pig iron for the first quarter continues a conspicuous feature and coincidently some sellers are disinclined to commit themselves for that delivery. While a few days ago sellers were making concessions with slight chance of obtaining business, they are today figuring cautiously on large tonnages. Practically all consumers are "shopping around." Producers are shipping their current production and also from stock, and certain large contracts on which these shipments are made expire this year. The result is a display of much activity and negotiation. Two lake furnace interests are not selling ahead. A fourth has taken 2000 tons from three or four customers for first quarter at market price at time of delivery. This arrangement was made at the instance of those buyers who believe first quarter prices will be lower. The same interest is offering to do business for first quarter at present quotations, as will another producer. Spot quotations are based on a valley price of $27.50. One seller has taken on a number of small lots at this figure. A freight rate of $1.77 brings the delivered price around Cleveland to $29.25. Another Cleveland maker is quoting $29 to $29.50, furnace, for Cleveland delivery. Inquiry is particularly heavy from Michigan, especially Detroit foundries. A lake furnace sold the American Car & Foundry Co. two 500-ton lots about 10 days ago, but more recent inquiries from that source have not been closed, so far as can be learned, though it is reported that 1000-ton lots have been closed for each of the Titusville, Pa., Buffalo and Detroit plants. The Westinghouse Electric & Mfg. Co., which was reported to have closed a week ago for 1250 tons with a valley interest for its Cleveland plant is again in the market with an inquiry for a round tonnage. A lake furnace is figuring on 6000 tons represented by about a dozen new inquiries received during the week, one being for 3000 tons. A Canton buyer closed for 100 tons with a lake interest at $28, valley.

The Pittsburgh Colonial Steel Co. is inquiring in this market for 750 tons of basic for delivery in December. No sales are reported; lake furnace interests say they are not quoting on basic at this time.

Competition Forces Price Lower

Buffalo, Nov. 21.—Stiff competition has again forced down the price of pig iron and reports that makers were doing as low as $25.50 on No. 2X (2.25 to 2.75 silicon) were verified. This does not establish a base price of $25 in itself. Inquiry is good, one interest reporting 7500 tons including a 1000-ton inquiry for foundry and a 500-ton inquiry from the General Electric Co. No. 2 plain has been sold freely here at $26 during

the week. Most makers are selling a little more tonnage than for some time, one interest disposing of 4000 tons. A report is current that the American Radiator Co. has bought 15,000 to 20,000 tons, but the rumor lacks authoritative backing.

Selling for Third Quarter

St. Louis, Nov. 27.—The past several days have developed more sales for the first quarter of 1923. The largest transaction reported is 1000 tons, to a melter in the district. Two 300-ton lots and a number of smaller tonnages also were sold, the aggregate approximating 2500 tons. This is much better than the record of recent weeks. There are a fair number of sales for spot shipment. The largest of these is 3000 tons of foundry iron, made by the St. Louis Coke & Chemical Co. to an east side melter. One selling agency reports its sales during the past two weeks as the largest for any fortnight this year. Melters with iron under contract are pressing for delivery. Representatives of several leading furnaces report no sales and declare that their customers are holding out for further price concessions. One large consumer expressed the opinion that $20 for southern and $25 for northern iron would be reached before melters purchase in volume. Southern iron holds steady at $23 for spot shipment and $24 for first quarter. Two leading Alabama makers have refused business at $23 for immediate delivery. There seems to be plenty of $23 iron offered. Some uncertainty exists as to the price of northern iron. While no quotation under $30, Chicago, has appeared, it is known that small tonnages of resale have gone at $28, and one as low as $27. The leading local producer continues to quote nominally $31 to $32, f.o.b. Granite City, but would probably shade this range on a large order.

Buying Movement Looked For

Birmingham, Ala., Nov. 27.—Sales of pig iron have not been numerous lately in the Birmingham district but inquiries are of such nature that furnace interests here believe they are on the verge of a substantial buying movement. A few sales have been made recently both for immediate delivery and for first quarter. The larger and more active furnace companies continue quoting $25 for No. 2, foundry, while the Alabama Co. and others have been selling at $24. Reports are current that substantial tonnages will bring a $23 price and some talk is heard of $22.50 for off-basic. Two of the smaller companies declare they soon will have to withdraw from the market because of heavy sales. The Sloss-Sheffield Steel & Iron Co. will operate five out of seven furnaces steadily. Repair work going on at the second city furnace is for the purpose of replacing the other furnace when it needs repairing. The Republic Iron & Steel Co. has two furnaces in blast. The Tennessee Coal, Iron & Railroad Co. now has seven furnaces on basic and two on foundry. The Gulf States Steel Co. is making basic. The Alabama Company has one on foundry as has the Central Iron & Coal Co. The Shelby Iron Co. is making charcoal iron. Melt in the home territory continues active.

Furnaces Take More Coke

Price Unchanged from Week Ago—Foundry Fuel 50 Cents Lower—Little Contracting Done for Either Grade

COKE PRICES, PAGE 1456

Pittsburgh, Nov. 28.—Additional tonnages of standard 48-hour fuel for blast furnace use in December have been closed at around $6.75 and $7, ovens. One producing interest which sold at $7 states that on the remainder of its output available it is quoting a minimum of $7.25. Other quotations of that character leaves the market notably unchanged from a week ago, or on the basis of $6.75 to $7.25. A broker which recently took an order from a blast furnace operator at $6.50 has been endeavoring to cover at $6.25 and even $6.50 but without success. One local steel producer bought 25 carloads in one direction and 50 carloads in another. The Pittsburgh Steel Co. closed on 6000 tons for December. The Reading Iron Co. bought a large quantity, and the New Jersey Zinc Co. has closed on 2000 tons at below $7. The International Nickel Co. closed on 6000 tons of medium sulphur coke at $6, while various makes of high sulphur coke have been sold for different lines of consumption at $5 to $6, ovens. Foundry coke is lower by 50 cents per ton. While some $7 and $7.25 prices have appeared in the past week or so this is understood to be for furnace coke of a structure which enables it to be sold as foundry. Standard selected 72-hour fuel has sold at $7.50 to $8, with certain brands bringing a premium above that minimum. Demand is light, foundries buying coke on a hand to mouth basis. Inquiries for first quarter coke of either grade have not appeared in large numbers, although there has been some sounding of the market by certain users. So far as reported no contracts have been consummated for shipments after Jan. 1. In the meantime some contracts for December tonnage of furnace coke which are adjusted from month to month have been priced to harmonize with the going market levels, influenced more or less by the prices on pig iron. Production according to the *Connellsville Courier* for the week ended Nov. 18 was 182,380 tons, as compared with 176,880 tons the preceding week.

Quote Lower Prices

Cincinnati, Nov. 28.—Coke prices are unsteady and incline downward. Some of the large Wise county interests yesterday announced lower prices for both furnace and foundry fuel, and the price of New River foundry declined $1 to $12, ovens, at which considerable tonnage was reported sold in this market for prompt delivery and on contract. Practically all Pocahontas ovens are out of the market. The past week's volume of business in the coke market fell far below that of the previous week. A few inquiries are current, including 500 tons for the National Cash Register Co. Reports indicate that Ohio blast furnaces are fairly well covered.

St. Louis Market Firm

St. Louis, Nov. 27.—The further decline in prices of eastern coke has failed thus far to lower the quotations made by local by-product ovens. While the movement from Connellsville and other districts is considerably easier, it is not sufficiently near normal to fill all requirements. As a result there is a strong demand for the local product. Industrial coke is in good demand, ovens reporting urgent calls for prompt and heavier shipments. The leading producers are shipping their entire output, and their reserves are at low ebb. The recent cold snap has stimulated buying of domestic coke. There has been no change in the coal situation, which is unfavorable from the seller's viewpoint. Railroad yards are congested with coal consigned to western points, and many mines are operating only two to three days a week.

Southern Market Steady

Birmingham, Ala., Nov. 27.—The coke market is steady, though the activity in spot transactions is not so apparent as a few weeks ago. Quotations are a little weak. Foundry coke is selling at $8 to $9.50. The Sloss-Sheffield Steel & Iron Co. has greatly reduced its large stock of coke at North Birmingham, at good prices for the tonnage. The Alabama By-Products Corp. will put its 25 new Koppers ovens at the plant at Tarrant City, suburb of Birmingham, in operation in a few days, making 75 ovens active. The company has been able to market all of its output promptly. Franchise has been granted the Alabama By-Products Corp. to lay about 4½ miles of gas mains, and fuel gas will be supplied the Stockham Pipe & Fittings Co. in East Birmingham, and other industrial plants in that vicinity. Some of the larger makers of coke are in the market occasionally for tonnage for their own needs.

Great Mechanical Coal Pier Contract Placed

Contract has been awarded by the Virginian railway to the Alliance Machine Co., Alliance, O., for the construction of what is said to be the largest mechanical coal pier in the world. The pier is to be erected at Norfolk, Va., and will represent an investment of more than $1,000,000. It will not be ready for operation until Jan. 1, 1924.

The pier is to be of a new design. It will consist of two double car dumpers, each handling two cars at a time. In addition there will be four movable loading towers, each tower having a 130-ton coal pocket while a steel belt conveyor will convey the coal from the towers. A mechanical coal trimmer will replace a hand trimmer now in operation at the railroad's present pier. In addition the installation will include four 130-ton bottom-dumping transfer cars, power controlled. In excess of 3700 tons of steel is involved in the project. The Hulett Engineering Co., Cleveland, acted as consulting engineer.

Buying Bars for 1923

Chicago Mills' Output for First Quarter Absorbed—General Motors Inquires for 80,000 Tons—Consumers Press for Delivery

BAR PRICES, PAGE 1456

Chicago, Nov. 28.—Bookings of soft steel bars during the past week has been unusually heavy. Inland Steel Co. has allocated its first quarter production and has no further bars to sell for that delivery. The leading interest, which is taking business for indefinite delivery, found its bookings of soft steel bars equal to preceding weeks. The automotive interests are not slowing their consumption of steel bars as they usually do in the fall. Railroads are taking considerable tonnages for repair work and manufacturing companies are in the market for considerable material. Manufacturers of shafting, bolts and rivets are pressing for delivery on contracts. While the leading producer here is quoting 2.00c, Chicago mill, on soft steel bars, it is understood prices at Pittsburgh are slightly weaker and while as low as 1.90c, Pittsburgh, is known to have been done, rumors are heard of 1.80c, Pittsburgh, having appeared. On the other hand, an eastern mill has recently sold several small lots to western users on the basis of 2.00c, Pittsburgh, for December delivery.

The General Motors Corp. has opened negotiations for 1923 requirements and the business now current is estimated to include 80,000 tons of bars and similar material for first quarter. Chicago mills, however, are unable to furnish either the tonnage or the delivery because of their sold-up condition.

Buying of bar iron continues slack and mills are not operating more than part capacity. The Republic Iron & Steel Co. will resume production this week on a small backlog. The price remains steady at 2.50c, Chicago mill.

Rail steel bars continue to be quoted at 2.00c, Chicago mill, with demand somewhat slower than recently. Most of the present production is being absorbed by manufacturers with some demand for these bars for reinforced concrete work.

Fair Sized Lots Bought

Pittsburgh, Nov. 28.—Merchant steel bar buyers continue to purchase in fair sized lots. Some, mainly the cold-drawn steel bar finishers, are interested in first quarter contracts. As yet no price announcement has been made by the Carnegie Steel Co. but the view commonly held is that its regular customers will be able to fill requirements at the 1.90c figure and others will pay 2.00c, which now is the representative spot market quotation. Here and there an effort still is being made to obtain 2.10c for small lots. Buying by agricultural implement interests promises to be larger than for two years past. Already a fair number of such orders are understood to be upon the books of makers. Mine car builders and other users also are ordering in small lots.

Refined iron continues quotable at 2.60c to 2.75c, base Pittsburgh. Low phosphorus melting bars at 4.00c to 4.05c, base Pittsburgh, failed to stir up sizable tonnage orders and the crucible steel interests continue to purchase only small lots as needed.

Want First Quarter Tonnage

Cleveland, Nov. 28.—Various consumers of bars including nut, bolt and rivet makers, strip and automobile accessories manufacturers, etc., are inquiring of the mills for tonnages for first quarter delivery. Some of the leading mills, however, because of their obligations running into the first quarter and the fact that they are owing many of these consumers tonnage for that delivery, are not anxious to take on additional commitments. Automobile builders also are inquiring for round tonnages of various materials for 1923 delivery. The Willys-Overland company was a recent buyer of about 800 tons of bars for early delivery. Prices are well established around 2.00c, Pittsburgh.

Demand Is Fair

Philadelphia, Nov. 28.—Steel bar demand continues fair and mills continue to find difficulty in making prompt shipment. The market is being held at 2.00c, Pittsburgh, but big tonnages are lacking to test the price. Iron bars are being quoted 1.95c to 2.00c, Pittsburgh.

Distribution Less Extensive

Pittsburgh, Nov. 28.—While distribution of cold drawn steel bars is not as good as four or five months ago, the volume still is heavy. Plenty of business is presented to makers for first quarter by larger users but they are reluctant to obligate themselves on actual contracts at the present market figure of 2.50c, base Pittsburgh. There will be sizable tonnages carried over from the present quarter into next year, however, and some customers will have protected themselves on all the cold-drawn steel they will need during that period. The automotive industry still continues a large consumer and other lines are taking their share.

Bolt, Nut and Rivet Orders Still Are Fair

NUT AND BOLT PRICES, PAGE 1520

Cleveland, Nov. 28.—Bolt and nut makers in this district report there still is a fair amount of business being placed. This includes specifications against old contracts as well as spot orders. The automobile industry and the railroads appear to be the heaviest buyers. While contracting for first quarter has not been started, numerous inquiries have been received by makers and it has been intimated prices prevailing at the present time will be named on first quarter business. Rivet demand is much the same as that for bolts and nuts. Prices are firm. No contracting as yet has been done on first quarter business and probably will not be until next month.

First Quarter Inquiries Out

Pittsburgh, Nov. 28.—Specifications on nut, bolt and rivet contracts continue to be filed freely and inquiries for first quarter requirements are coming out in fairly large numbers. These involve a variety of tonnages. From a carload to 200 tons at a time is the usual amount with an occasional larger tonnage. Railroads have been buying nuts and bolts as well as rivets liberally although their purchases of track bolts have not been particularly sizable of late. Discounts are being firmly held.

Specifications Fall Off

Chicago, Nov. 28.—Although the situation in bolts and nuts continues satisfactory to producers, a definite falling off of specifications against contracts has been noted the past few days. Producers still are operating their plants at as high a rate as possible under present conditions of material supply and are not worried at the change in demand. With last quarter more than half gone, the present falling off in specifications is taken as a temporary lull which will be replaced shortly by a rush of business to clean up before the end of the year. Prices remain steady.

Hoop Price Is Strong

HOOP PRICES, PAGE 1456

Pittsburgh, Nov. 28.—Makers of hoops and bands here state there is no occasion for weakness in price and they continue to quote 2.90c, base Pittsburgh. They have managed to collect a large backlog of business on that basis and while output for the first quarter is not yet fully obligated, orders continue to be filed from week to week. These range from a carload up to a few hundred tons at a time. Some of the cooperage companies have contracted for their full quarter's needs, specifications to be issued later.

Breaks Output Records

Toronto, Ont., Nov. 28.—The British Empire Steel Corp. in October produced 29,000 tons of steel, thereby establishing a new record for 10-furnace production. The largest previous monthly output was in 1906, the total being 26,504 tons. A new daily record was set by the billet mills at Sydney with a production of 1112 tons in October.

Strip Sales Are Large

STRIP PRICES, PAGE 1456

Pittsburgh, Nov. 28.—Last week was the busiest one of the year in strip steel bookings, both hot and cold-rolled. Orders were evenly divided between the two grades. A few were for first quarter requirements. The tonnages placed involved amounts up to 200 to 500 tons and at least one 1000-ton lot was booked by one producer here. Customers anticipate continued difficulty in getting wanted material because of car shortages, embargoes and other transportation trou-

bles and because they believe that production schedules will be curtailed throughout the winter they are getting their specifications on books for earliest possible attention. Notwithstanding reports of weakness in connection with hot-rolled strips from other districts, mainly northern Ohio, the price is unchanged here at 2.90c, base Pittsburgh, with cold-rolled firm at 4.50c, base Pittsburgh.

Trumbull Stack Sets New Production Record

Youngstown, O., Nov. 28.—The new stack of the Trumbull-Cliffs Furnace Co. at Warren, O. set a new high record Nov. 22 when it poured 867 tons of iron in a 24-hour period. This is believed to be a world's record as well. The previous high mark of 811 tons also was set last week. The furnace is of 600 tons daily rated capacity. It is stated that the records were made under somewhat unfavorable circumstances. The output of the furnace is used as hot metal in the 7-unit, open-hearth department of Trumbull Steel Co. This department which is producing 40,000 tons of steel per month is able to take care of nearly all the high production of the furnace.

Lose Benefit of Subsidy

Washington, Nov. 28.—Under an amendment to the ship subsidy bill to which the special session of congress is giving attention, all industrial steamship lines such as those of the United States Steel Products Co., subsidiary of the United States Steel Corp., and the Ore Steamship Corp., subsidiary of the Bethlehem Steel Corp., are to be excluded from the benefits of the measure. Another amendment denies industrial lines the privilege of making deductions from their income tax when setting aside the deduction for building ships in American yards. The provision for rebating 5 per cent freight charges on exports shipped in American bottoms also is eliminated.

Freight Loading Greater

Washington, Nov. 28.—Loading of revenue freight in the week ending Nov. 18 reached 969,094 cars, a new high for November. This is an increase of 16,000 tons over the preceding week, of 180 000 over the corresponding week last year and of 80,000 over the same week in 1920. Coal loading in the same period was 205,024 cars, the highest since October, 1920. Coke loading was 12 431 cars, the highest in two years. Ore loading fell off 7000 cars to 32,780 cars.

Duluth Operations High

Duluth, Nov. 28.—Operations at the plant of the Minnesota Steel Co. are at 80 per cent of capacity, the highest in two years. Two blast furnaces are operating. The number of employes is steadily being increased. Bookings from consumers in other territories are exceptionally heavy and the company is broadening the diversity of its products as additional machinery is installed.

Car Repair Plates Active

Railroads Calling for Heavy Tonnages—Tank Business Continues in Large Volume—Further Recession in Price

PLATE PRICES, PAGE 1456

New York, Nov. 28.—Only fair buying has featured the plate market in this district during the past week. Of chief importance has been the buying by the railroads, which have placed repair plate tonnages in considerable volume. The largest inquiry reported here involves 2000 tons of plates for the Louisville & Nashville. Further recession in prices features the plate market. It is known that 1.90c, base Pittsburgh, has been done on attractive lots, while lower is reported, but not verified. The market may be quoted at 1.90c to 2.00c, base Pittsburgh. The Phoenix Iron Works Co. has booked an order from the Texas Co. for ten 64,000-barrel tanks, about 2000 tons. The Reeves Brothers Co. has booked an order from the same interest for ten 55,000-barrel tanks, about 1500 tons. Some other oil tank business has been under negotiation but is not developing very rapidly. In shipbuilding, the only new development of importance is the placing of a 338-foot boat by the Hudson River Day Line with the Bethlehem Shipbuilding Corp. The Sun Shipbuilding Co. has taken a contract for reconditioning the Munson liner COVERDALE.

Market Weaker at Boston

Boston, Nov. 28.—Despite a slight revival in plate business due to demand from car repair shops, prices are softer and several sales recently have been reported at 1.95c, base Pittsburgh.

1500 Tons Bring 1.95c

Pittsburgh, Nov. 28.—Plates have been purchased at 1.95c, Pittsburgh, but from a valley mill for delivery nearby, making the Youngstown price slightly above 2.00c; about 1500 tons were involved. Several producers, however, are holding firmly to a minimum of 2.00c, base Pittsburgh. The Phoenix Iron Works, Meadville, Pa., and other tank builders continue to purchase from time to time for tank orders as they are received. The New England Oil Co. recently was in the market for some 55,000-barrel tanks; the Humble Oil Co. of Texas now wants several tanks; a California oil interest is in the market and several other southern oil companies want one or two tanks each. It is reported here that the American Bridge Co. and the Chicago Bridge & Iron Works divided the order from the Standard Oil Co. of Indiana for 20 to 40 80,000-barrel tanks for Casper, Wyo., involving about 300 tons each. The Independent Bridge Co., Pittsburgh, was low bidder on three barges for the United States Engineers' office, Pittsburgh, involving 450 tons of plates. This department opens bids on Dec. 20 for steel lock gates for Lock No. 1, Allegheny river. The Midland Barge Co. was low bidder on the steel-hulled derrick boat for this same office. Perhaps 10 or 12 additional barges now are being bid upon and contracts probably will be awarded within a week or 10 days.

Big Tank Business Near

Chicago, Nov. 28.—Apparently some unusually large lots of oil storage tanks are being negotiated under cover and mills have received inquiries for 15,000 to 16,000 tons of plates and shapes for this purpose, the buyer of the tanks not being divulged. It appears likely this business may be placed during the present week. Railroad car business is calling for heavy tonnages of steel plates and these two outlets are taking full production. Inland Steel Co. has a few sheared and universal plates available for first quarter delivery, but ordinary demand will absorb this small excess in a short time. This interest is quoting 2.30c, Chicago mill, for assured first quarter delivery. The leading interest continues to quote 2.10c, Chicago mill, on plates.

The Standard Oil Co. of Indiana has placed 20 tanks each with the Chicago Bridge & Iron Works and the American Bridge Co. Each tank is to be of 80,000 barrels capacity. The entire lot requires 12,000 tons of plates.

Competition Keen

Philadelphia, Nov. 28.—Plate buying has improved but the volume is inadequate to maintain mill operations at higher than 50 per cent, hence there is considerable competition for attractive business. Tonnages are being booked at 1.90c to 1.95c, Pittsburgh, but the bulk of current business continues to bring 2.00c. The Pennsylvania and the Reading railroads have bought tonnages in the past week, the latter 1500 tons. The Reading railroad has decided to wait until January to place two ferry boats and four car floats. An unusual feature in the opening of bids tomorrow for 9000 tons of steel for the Delaware river bridge is that considerable tonnage for 4¼-inch plates is involved, these being for the bridge roadway foundation.

Lake Freighter Is Placed

Cleveland, Nov. 28.—About 3000 tons of steel will be required for a new lake freighter, contract for which has just been awarded to the Toledo Shipbuilding Co. The identity of the buyer of this vessel has not been disclosed. Various lots of plates for oil field and refinery purposes continue to come into the market. One of these involves 500 or 600 tons for stills which will be built by a Louisville, Ky., manufacturer. Otherwise new plate business is limited and the market continues to show softness where attractive lots are involved. While 2.00c, Pittsburgh, remains the more common figure, 1.90c is being done on some desirable tonnages and where the business is unusually attractive, even this figure is understood to have been underquoted.

Scrap Weakness Prevails

Further Reductions Reported—Heavy Railroad Lists Offered, Puzzling Dealers as to What To Bid—Some Buying To Cover

SCRAP PRICES, PAGE 1524

Chicago, Nov. 28.—Accumulations of scrap are being offered by railroads in much better tonnage than has been the case for several months. While the increase is general and most railroads are marketing larger tonnages, a few lists are unusual and promise to have a decided effect on the market. The Illinois Central railroad will close this week on 17,000 tons and the Pennsylvania railroad is offering a total of 38,500 tons, 31,000 tons being in the eastern region, 2500 tons in the northwestern region and 5000 tons in the southwestern region. The Chicago, Burlington & Quincy offers 4000 tons and the Monon 500 tons. Much interest attaches to the Illinois Central sale, as this scrap is for December and January delivery and dealers are in doubt what to bid in view of the generally weak situation. The market is holding fairly steady with slight recessions in a few grades. Consumers continue to remain out of the market and relatively little scrap is being bought, some small lots being taken for immediate use. Railroad malleable forms about the only active grade, demand for this material being due to long continued scarcity of such grades as knuckles and couplers.

New Buying Has Slumped

Buffalo, Nov. 28.—With mills unwilling to build up large inventories, buying has taken a slump. Three consumer mills are in the market for small tonnage but one large consumer is taking nothing. The market is about $19 for heavy melting steel with some latitude upward. It is a feature of the present market that dealers shipping on month-old higher priced orders, are willing to pay more for material than the mills, and much of the buying is being done by dealers. Dealers are making every effort to complete shipment on these orders on schedule. Almost every grade is figuring in the transactions but all to a limited extent.

Southern Quotations Lower

Birmingham, Ala., Nov. 27.—The scrap iron and steel market in the South is weak, quotations having fallen from $1 to $2 per ton lower. The largest consumer of heavy melting steel in this section, though operating its plant actively, has not asked for prices for the past week or 10 days and apparently is well provided. Dealers have been buying in coal mining scrap lately and now are assorting it. Much old material is still moving out on old contracts but the dealers are keeping up yard stocks. The uncertainty of the pig iron market has affected the scrap market.

Weakness Still Prevails

St. Louis, Nov. 27.—Aside from desultory exchanges among dealers, the market for scrap iron and steel is devoid of activity, and the prevailing tone still is weak. The industries have withdrawn as purchasers, and several of the most important consumers, including the National Enameling and Stamping Co., have intimated they have no intention of taking on tonnages earlier than Jan. 1. Concommitant with halted buying are rather liberal offerings from the carriers and other sources, and the market is burdened with considerably more tonnage than it is able to absorb. About the only exception noted in the oversupply is in the case of specialties, such as car wheels, knuckles, couplers, springs, etc. Relaying rails are active, and some large transactions have taken place during the past several days, including 1000 tons of 80-pound rails to a local buyer. Melting of scrap continues on a large scale, despite the indifference in new buying. Dealers report excellent shipping instructions. The Wabash railroad closed a list of 4000 to 5000 tons, and has announced additional offerings including 600 tons of yard scrap, 500 tons of No. 1 rails and 500 tons of miscellaneous rails. Small lists were announced by the St. Louis and Southwestern and the Frisco roads.

Covering Tonnages Are Placed

Pittsburgh, Nov. 28.—Buying to cov-

(Concluded on Page 1475)

Await Semifinished Prices

Buyers Making Inquiries on Material for First Quarter—Mills Are Reluctant To Quote—More Sheet Bars Placed by Corporation

SEMIFINISHED STEEL PRICES, PAGE 1456

Pittsburgh, Nov. 28.—Sheet and tin bar users who buy their supplies in the open market have been endeavoring to line up first quarter prices. In the absence of definite quotations for that period, the market remains nominal at $38, Pittsburgh or Youngstown, the same level applying to slabs and 4 x 4-inch rerolling billets. One inquiry for sheet bars involves 5000 tons; a billet inquiry involves 5000 tons monthly for three months, and several other similar tonnages, together with a few smaller ones, are current. Regular customers of the Carnegie Steel Co., still having sheet and tin bars due them on fourth quarter contracts, expect that some additional tonnage will be available to them on the same basis, $35, Pittsburgh or Youngstown. Independent producers generally expect that the open market quotation will be $37.50, base, although no sales as yet are recorded at that level. Several users of forging billets have come into the market to close upon lots up to 200 tons at a time. For these, as high as $47.50, Pittsburgh, has been paid. One consumer continues to buy in heats, 50 tons at a time, taking an average of four heats a week.

Wire rod producers are well committed, in one or two cases for 60 days ahead and are indifferent to placing more tonnage upon their books. While the American Steel & Wire Co.'s figure is unchanged at $45, Pittsburgh, that is nominal since this interest has not been a market factor for some time. From $47.50 to $50, Pittsburgh, represents the current market, the latter price being quoted on small lots this week.

Skelp continues to be quoted generally at 2.00c, although one or two makers are asking slightly higher figures. Demand is not as heavy as it was although most users have skelp coming in on regular contracts.

First Quarter Price Indefinite

Youngstown, O., Nov. 28.—Definite information is lacking in regard to the price of first quarter sheet bars, billets and plates. While some light tonnages of sheet bars for 1923 delivery have been placed here at $38, Youngstown, distinction must be made between the forward and the spot market. According to expressions obtained from semifinished producers, the price of first quarter sheet bars is $38 while the spot market ranges from $37.50 to $38, Youngstown. Rumor is current, however, that a sale of sheet bars for prompt delivery recently was consummated in this district at a price below $37.50, Youngstown, although the report could not be confirmed. The difficulty surrounding transportation is influencing producers to withhold first quarter prices on semifinished steel although one important interest contemplates making known its position some time this week.

Not Quoting for Next Quarter

Cleveland, Nov. 28.—The leading producer of sheet bars, billets and slabs still is quoting $38, Youngstown or Cleveland mill, depending on point of delivery, for tonnages over the remainder of this year, but has not as yet named its figure for the first quarter of 1923. This interest denies having booked any business at less than $38. There is a moderate amount of inquiry; but no additional transactions are reported. A consumer of wire rods is inquiring in this market for 500 to 1000 tons, and claims this tonnage can be bought under $50.

The American Sheet & Tin Plate Co. has been a recent buyer of 5000 tons of sheet bars for its Crescent plant in this city which is being started after an extended idleness.

Some Tonnages Are Placed

Philadelphia, Nov. 28.—One large and several small tonnages of rerolling billets have been sold in this district at $30, base Pittsburgh. This price apparently has not been shaded here. Small lots of forging have been sold at $45, Pittsburgh. The pressure for wire rods continues. It is difficult to place orders. The market remains at $45 to $50, Pittsburgh. It is reported

here the Steel corporation was able to place some sheet bars in the Pittsburgh district at $35. No developments are shown in sheet bars here.

Independent Mills

Dissatisfied With New Tin Plate Price for First Quarter

TIN PLATE PRICES, PAGE 1456

Pittsburgh, Nov. 28.—Dissatisfaction from various sources among the independent producers is heard over the $4.75 per base box of 100 pounds, Pittsburgh, price on tin plate announced by the American Sheet & Tin Plate Co. on Nov. 23 to apply through the first quarter to jobbers and throughout the first half to manufacturers. These claim that production costs will not permit them to sell at the going market level and make any profit. Some of these were among the first last spring and summer to offer concessions from the official level then prevailing of $4.75, taking business at as low as $4.25 and $4.35. Larger canmakers are well covered for the first quarter; the American company's backlog, together with what new business is being placed this week, will take its entire output to the end of March. Present operating schedules are expected to continue, the leading interest's average about to be increased this week by the starting up of Crescent works at Cleveland for which steel has been secured. One can company recently contracted for 1,000,000 base boxes to be shipped during the first quarter and already has filed specifications on upward of 25 per cent of that tonnage. Other users have placed orders for smaller amounts, numerous single carloads being noted.

Warehouse Orders Still Fair; Prices Firm

WAREHOUSE PRICES, PAGE 1516

Cleveland, Nov. 28.—Demand for iron and steel products out of warehouse is practically unchanged from a week ago. Shipments from mill still are deferred and as a result some jobbers' stocks are not as complete as they desire them. As a result of this some business is being declined. Prices are firm at the established levels.

Improvement Is Reported

Philadelphia, Nov. 28.—Iron and steel demand from warehouse in this district during the past week has exceeded that of last. General manufacturing operations are satisfactory and are furnishing a considerable volume of orders. Jobbers anticipate good business the remainder of the year. Prices are unchanged at the quoted levels.

George W. Olmstead of Ludlow, Pa., associated with E. L. Phillips & Co., of New York, has taken an option on the controlling stock of the Hornell Electric Co., Rochester, N. Y., and is expected to exercise it in January. The prospective owners expect to use power from Niagara Falls, if possible.

Book First Quarter Sheets

Independents Following Leading Interest in Continuing Present Prices in Effect—Full Finished Still Undefined—Black Weak at 3.35c

SHEET PRICES, PAGE 1456

Pittsburgh, Nov. 28.—Sheet demand continues strong from diversified sources. Prices for the first quarter of 1923 as announced by the American Sheet & Tin Plate Co. last Thursday, reaffirmed the present quarter levels of 2.50c, 3.35c, 4.35c and 4.70c, base Pittsburgh, on blue annealed, black, galvanized and full finished No. 22 automobile body sheets. This action on the part of the leading interest was more or less expected since it had enough specifications to carry over into 1923, to utilize practically all of its output for the first two months, and on some sizes and gages of certain grades, part of March. With this carryover, together with orders received since Nov. 23, the date of the announcement, practically all production for that quarter has been obligated, based on present operating schedules. There seems little likelihood of this company being able to increase greatly its steel supply in order to bring about a higher operating rate. At present it is operating 77 per cent of its hot mills as against 74 per cent last week and 72 per cent the week before. While independents generally do not have such a favorable backlog of business, current demand is fairly heavy and now that the market is more clarified there is a disposition to purchase. Those now naming the same schedule of prices for the first quarter are gradually filling up their order books. Heavy orders continue to be placed for full-finished automobile sheets and the carryover in this grade is particularly large. It is intimated that in some cases specifications to be submitted for shipment during the first three months of 1923 will practically double those furnished in the last quarter of this year. Spot market quotations up to 5.00c, base Pittsburgh, still are noted for full-finished automobile sheets but weak features still occur in connection with black sheets. Prices around 3.25c and 3.30c still are being quoted by two or three makers who are anxious to concentrate on black sheets rather than to galvanize them at present high spelter costs. Sheet consumers generally, outside of the automotive industry, are well covered on their first quarter requirements; others now are in the market so that it has become necessary to allot tonnages for shipment during that period. From all accounts, early 1923 will be a good selling period in the sheet industry.

Open Books for First Quarter

Youngstown, O., Nov. 28.—Practically all sheet producers in this district have opened their books for first quarter business for blue annealed and black, although they are hesitating in accepting galvanized tonnages. High spelter cost is stated to be influencing some galvanized makers in refusing business at 4.35c, Pittsburgh. Most mills insist on 4.50c. Good customers are being served at 4.35c, although individual requirements are being scanned closely. The volume of first quarter sheets booked by makers here, since the Steel corporation made known its forward price, is comparatively small although it is too early to perceive just what effect the price announcement has had on the market. In view of the inventory period ahead, not much of a demand for any grade of common sheets is contemplated until well into December or shortly after the new year. Black is quotable at 3.35c, though it is weak at this figure, blue annealed at 2.50c and galvanized between 4.35c and 4.50c base, Pittsburgh.

Prices for automobile sheets for next quarter delivery still are uncertain. No announcement has been made, although some producers quietly have been accepting business in light tonnages. When books are opened little doubt remains that they will be filled quickly, in view of the construction programs mapped out for 1923 by several large automobile manufacturers in Michigan. While some producers of high grade stock have a tentative idea of next year's market as 5.00c, Pittsburgh, some spot tonnage can be had at 4.85c. Whether this will have a bearing on the early 1923 market is not expressed. Meanwhile producers hesitate to make their intentions known, but state that a price announcement is not far distant. The new list of extras recently revised and adopted by the Steel corporation has been adopted by independent sheet producers in this district.

Little Change at Chicago

Chicago, Nov. 28.—Consumers of steel sheets have been assured of a definite tonnage for delivery during the first quarter, and producers have filled their books for that delivery. Prices remain steady at 2.50c, 3.35c and 4.35c, Pittsburgh, for blue annealed, black and galvanized. The Inland Steel Co. has divided its first quarter production among its regular customers, being able to cover only part of their requirements. The leading producer is also covered for its production for the first three months of next year. Consumers knowing how much they can expect from western sheet mills are endeavoring to cover the remainder of their requirements from eastern sources.

Adopt New Extras

Buffalo, Nov. 28.—Black sheets are being quoted freely at 3.35c, Pittsburgh, with the new list of extras in effect. Inquiry has increased and business is good.

Mill Operations Maintained

Philadelphia, Nov. 28.—Sheet demand lacks activity but is sufficient to maintain mill operations. Nevertheless there is further easing in prices. Blue annealed generally is 2.60c Pittsburgh but some independents now are doing 2.50c on attractive orders. On the other hand, smaller orders occasionally are going at 2.75c. Black sheets are 3.35c. Some mills want 4.50c for galvanized but the grade is obtainable elsewhere at 4.35c. Independent makers generally have not opened their books for first quarter but taking such business when offered by regular customers.

Shape Buying Prolonged

Fabricators Book Additional Tonnages as More Building Projects Appear —Small Lots Active with Some Larger Ones Placed—Prices Firm

STRUCTURAL SHAPE PRICES, PAGE 1456

New York, Nov. 28.—While structural buying during the past week has been slower, inquiry is holding up well and at the same time there are new projects, some of considerable size, being considered and which will likely develop in active inquiries in the course of the next few weeks. One of these is a hospital at Seventy-second and Park avenue, New York, probably requiring 3000 tons. A truce until Dec. 31 has been called in the strike of bricklayers which was expected only to hinder slightly structural steel operations.

Shape prices continue steady at a minimum of 2.00c, Pittsburgh, with quotations on fabricated steel slightly easier. An excellent spring building program is promised, but most fabricators are not as yet booked up satisfactorily for the intervening winter season.

Stock Buying Starts

Boston, Nov. 28.—While structural awards still show seasonal dullness, buying on the part of warehouses and some fabricators to replenish depleted stocks has started and most steel companies look for a good volume of business in this direction before the first of the year. Buyers, of course, are anxious to avoid having stocks go on this year's budget, but mill deliveries which are averaging from five to seven weeks give assurance that stocks bought at the present time will arrive after Jan. 1. During the week a contract was let to George A. Fuller Co. for an insurance building, Boston, calling for approximately 800 tons of steel. The price is 2.00c, Pittsburgh.

Bridge Bids Are Opened

Pittsburgh, Nov. 28.—Bids were opened on Saturday of last week for the Fortieth street bridge, Pittsburgh, with the following result as far as the superstructure is concerned, which involves about 6500 tons of plates and shapes: McClintic-Marshall Co., carbon steel, $708,536, copper-bearing steel $728,677; American Bridge Co., carbon steel $748,108, copper-bearing steel $804,248, and Fort Pitt Bridge Co., carbon steel $900,646, copper-bearing steel $920,786. So far as reported, the award has not yet been made. The Riter-Conley Co. was awarded six radio towers involving 1200 tons of structural steel, from the Tropical Radio Co. Other awards for the week involved relatively small and unimportant tonnages. While several fabricators are using 1.90c, base Pittsburgh, as a price on raw material in their estimates, no new sales or contracts are recorded on that basis. It is expected, however, that the Carnegie Steel Co. will allow its regular customers to extend their bookings for the first quarter at that level.

No Check to Building

Chicago, Nov. 28.—Continuance of building operations much beyond the period when it usually shows a decided drop in bringing unusually heavy business in structural material far into the winter. This is met not only in demand for structural shapes, but also in deformed bars for reinforced concrete work. In the latter, mills are unable to furnish sufficient material to meet requirements. Inland Steel Co. has divided its first quarter production of structural material among its regular customers and has practically nothing further to offer for that period. Its price continues at 2.20c, Chicago mill, for plain material. The leading producer continues to quote 2.10c, Chicago mill, for such tonnage as it can book for indefinite delivery.

Report 2.00c Is Shaded

Buffalo, Nov. 28.—Bookings are fair, and the price has remained very firm at 2.00c, with the exception of one mill which is reported to have quoted 1.95c.

Week's Awards Smaller

Cleveland, Nov. 28.—After the busy period of a week ago, when 3700 tons of structural shapes were placed with fabricators for work in this district, awards were somewhat fewer and for smaller tonnages, numbering only two and aggregating only 367 tons. One of these was for 250 tons for the Altoona, Pa., high school placed with the Fort Pitt Bridge Works through its Cleveland office which negotiated through the H. J. Conrath Co., Erie, the general contractor. The other job was for 117 tons for a local manufacturing building placed with the Van Dorn Iron Works. The Alliance Machine Co., Alliance, O., is to place 3700 tons of plain material for a large pier for the Virginian railroad at Norfolk, Va., contract for which has just been awarded. Structural shapes prices are firm at 2.00c, Pittsburgh.

Demand in East Better

Philadelphia, Nov. 28.—The structural shape demand is somewhat better than in preceding weeks and is adequate for maintaining the present rate of 75 to 90 per cent of capacity of eastern mills. A new factor in the market is the Eastern Steel Co. which will start its 12-inch mill and two of its six open-hearths today. Most of the current business is at 2.00c Pittsburgh but attractive orders bring 1.95c and, in some special instances, 1.90c.

CONTRACTS PLACED

Awards reported this week	9,288 tons
Awards reported last week	10,912 tons
Awards reported two weeks ago ..	16,558 tons

1880 tons for Rich Bros. department store, Atlanta, Ga., to reinforced concrete.

1685 tons for power station for Middle West Utilities Co., Grand Tower, Ill., to Mississippi Valley Structural Steel Co.

1200 tons, six radio towers for the Tropical Radio Co., to the Riter-Conley Co., Pittsburgh.

1000 tons, hospital for joint diseases, 124th street, New York, to Hinkle Iron Works.

973 tons for transit sheds, City of Los Angeles, to the Austin Co.

900 tons, apartment, 1060 Park avenue, New York, to an independent shop.

700 tons, apartment in West Seventy-first street, New York, to Paterson Bridge Works.

500 tons, pier work for Virginian railroad, Norfolk, Va., to Virginia Bridge & Iron Co.

400 tons, Methodist Episcopal hospital, Brooklyn, to George A. Just.

375 tons, warehouse, Mt. Vernon, N. Y., to Hedden Iron Construction Co.

250 tons, apartment in East Sixty-first street, New York, to A. E. Norton Inc.

250 tons, high school, Altoona, Pa., to Fort Pitt Bridge Works; general contractor H. J. Conrath Co.

214 tons for station at Phelps avenue, Springfield, Mo., for the Springfield Gas & Electric Co., to unknown fabricator.

201 tons for machine shop addition at St. Louis, for the Missouri Pacific railroad, to the Mississippi Valley Structural Steel Co.

195 tons for garage for the Fair, Chicago, to Lakeview Iron Works.

125 tons, building for East Penn Electric Co., Pine Grove, Pa., to Phoenix Bridge Co.

117 tons, building for Grabler Mfg. Co., Cleveland, to Van Dorn Iron Works.

103 tons for two 60-foot spans for the Rock Island railroad, Genesoe, Ill., to Milwaukee Bridge Co.

100 tons, garage, Hackensack, N. J., to Hay Foundry & Iron Works.

CONTRACTS PENDING

2300 tons for power station for Public Service Co. of Northern Illinois at Joliet, Ill., bids being taken.

2000 tons, Elks club, Newark, N. J., previously reported as contemplated, now up for figures.

1900 tons, West Spokane street bridge, Spokane, Wash., bids close Dec. 8.

1350 tons, preliminary work on Brooklyn-Staten Island tunnel, New York, Patrick McGovern low bidder.

1400 tons for plant for Lehigh-Portland Cement Co., to be erected near Birmingham, Ala., pending.

1300 tons, Carpenter apartment, Fifth avenue and Ninety-sixth street, New York, pending.

1200 tons, Y.M.C.A. addition, Fifty-fourth street, New York, bids asked.

1000 tons, apartment for the 32 Fifth Avenue Corp., New York, specifications to be issued shortly.

800 tons, apartment for S. & L. Building Corp., Broadway and Eighty-second street, New York, pending.

800 tons, insurance building, Boston, bids in, general contract to George A. Fuller Co.

712 tons for pier sheds for port commissioners of New Orleans, bids asked.

500 tons, public service building, Newark, N. J., bids asked.

400 tons, Civic auditorium, Stockton, Cal., plans completed.

300 tons, public bath house, 124th street, New York, pending.

300 tons, bridge for Chesapeake & Ohio railroad, pending.

300 tons, Pantages theater, San Diego, Cal., bids asked.

300 tons, branch for Metal & Mechanics bank, West Fifty-fourth street, New York, pending.

300 tons, Elks club, Union Hills, N. J., pending.

200 tons, bridgework for Southern railroad, pending.

200 tons, parish house for Reform church, Brooklyn, bids asked.

150 tons, high school, Beverly, Mass., bids in, general contract let.

150 tons, apartment building, Allston, Mass., bids in.

100 tons, apartment building, Brookline, Mass., bids in.

100 tons, telephone exchange, Asbury Park, N. J., pending.

Wire and Nail

Inquiry Is Heavy—Mills Seek to Increase Output

WIRE PRICES, PAGE 1456

Chicago, Nov. 28.—Except for the problem of increasing production, wire mills are mostly interested in deliveries. With plants operating about 65 per cent it has been impossible to meet requirements of delivery and users of wire and nails are using every effort to obtain larger shipments. Inasmuch as there are no mill stocks and comparatively little in the hands of jobbers, demand is reflected immediatey to the mill. Inouiry is heavy in practically all lines. Sales of woven wire fence for spring delivery are being made steadily and this department promises to be covered promptly. Weather conditions have cut down on roofing operations

and demand for large headed nails has fallen off proportionately. The market continues at 2.45c, Pittsburgh, for plain wire and 2.70c, Pittsburgh, for nails.

Deliveries Much Deferred

Pittsburgh, Nov. 28.—Business for from five to six weeks ahead is in the hands of some wire producers here, particularly on nails. Makers expect that five or six weeks hence the same condition will apply since current demand is so heavy they have absolutely no opportunity to collect stocks upon which to fall back. Jobbers are urging deliveries so that stocks can be built up. A year ago jobbers' stocks were large and stocks in the hands of producers were greater than at any time in their histories. Today the opposite condition prevails with the possibility that unless an increased scale of operations is made possible, a more or less severe shortage of wire products will exist. In the meantime the average operating rate continues unchanged at between 70 and 80 per cent. Spring business in wire fencing and barbed wire, etc., continues to be booked and it is expected that the agricultural trade will be better than at any time during the past two years. Recent sales of cement-coated nails have been heavy, packing case and other consuming lines taking fair sized tonnages.

Demand Continues Heavy

Buffalo, Nov. 28.—Galvanized, bright and annealed wire as well as all the specialties continue in heavy demand with deliveries being advanced daily.

Ship More Coke Abroad

Washington, Nov. 28.—Exports of coke from the United States in October totaled 38,613 tons valued at $503,716 compared with 22,256 tons valued at $193,598 in October, 1921, the department of commerce states. In the first 10 months of 1922 coke exports amounted to 294,894 tons, against 220,507 tons in the same 10 months of last year. Exports of bituminous coal were 1,729,425 tons this October, valued at $10 834,993, and in last October 1,330,304 tons, valued at $6,494,672.

To Enlarge Plant

Alliance, O., Nov. 28.—Enlargement of the plant of the Alliance Machine Steel Casting Co. will be made at once following action of the board of directors Nov. 26 in adopting a resolution authorizing the errection of a plant extension. The addition will more than double the floor space of the company's plant, and will be 75 x 600 feet. The extension will be ready for operation Feb. 15.

To Confer on Wages

The Federal union, composed of employes of the H. B. Smith Co., Westfield, Mass., exclusive of the molders, has decided to waive its contention that the plant be operated as a closed shop and instead will continue conferences for a 15 per cent wage increase.

The Emporium, Pa., furnace went into blast on foundry last week. The Chateaguay furnace at Standish, N. Y., resumed Nov. 28 on low phosphorus.

St. Paul Buys 7500 Cars

Is Outstanding Feature in Equipment Market—Builders Appear Sold Up —Rail Inquiries Again Come Out—Locomotive Buying Continues

RAILROAD TRACK MATERIAL PRICES, PAGE 1456

Chicago, Nov. 28.—Purchase of 7500 freight cars by the Chicago, Milwaukee & St. Paul is the outstanding feature of the railroad situation at present. This purchase has been held up for some time by the finance committee of the railroad. In addition, few cars have been placed with builders except some passenger equipment. Further inquiry for new freight cars is coming out. Only the Bettendorf Co. and the Western Steel Car & Foundry Co. are able to give deliveries before June, 1923, on orders booked at present. This indicates the soldup condition of car builders. The car situation promises steel mills and car builders heavy business through 1923 and possibly bevond.

Some inquiry for rails is coming out in spite of the recent heavy buying. An inquiry for 10,000 tons is being negotiated by one mill. The Louisville, Henderson & St. Louis is inquiring for 1000 tons. Light rails are in fair demand.

Track fastenings are being sought in relatively large quantities and business in this respect is keeping up to the mark.

More Locomotives Ordered

New York, Nov. 28.—While little of special interest developed in demand for cars, orders for locomotives continue to come out freely. The American Locomotive Co. booked two switching engines for the Richmond, Fredericksburg & Potomac and five Pacific type locomotives for the Delaware, Lackawanna & Western. The Baldwin Locomotive Works closed on three locomotives for the Duluth & Iron Range, two for the Wisconsin & Michigan, two switching engines for the Detroit & Toledo Shore Line and one for the Pittsburgh Steel Co. New inquiries include three switching engines for the Calumet & Arizona Mining Co., two for the Aluminum Co. of America, and one for the Fonda, Johnstown & Gloversville.

Week-to-Week Orders Fair

Pittsburgh, Nov. 28.—A fair number of orders for light rails continue to be placed from week to week and except where it is necessary to meet competition of rerollers with a price around 2.00c, the regular market is 2.15c, base Pittsburgh. Single carload orders rule. Coal mining companies and lumber camp operators furnish the larger percentage of the orders although occasional ones come from general contractors. Track accessories continue quiet since most of the roads are occupied with furnishing specifications on their contracts placed in October. The prices as quoted are firm.

Car Material in Demand

St. Louis, Nov. 27.—Demand for car building material holds up well. Three hundred tons of tank steel was taken by a Southwestern railroad. Daniel Upthegrove, president of the St. Louis & Southwestern railroad, has announced a $5,000,000 improvement program. It includes the purchase of 500 box cars, 500 automobile cars and 200 convertable cars for hauling coal and ballast, the installation of a considerable amount of new machinery in shops, particularly at Pine Bluff, Ark., and Tyler, Tex., the replacing of 75-pound rails on 100 miles of main line, and the conversion of locomotives used in Texas from coal to oil burners. The purchasing of new equipment will account for about $3,000,000 of the $5,000,000.

Inquiry Heavy for 1923

Boston, Nov. 28.—New England street railroads are inquiring for frog and switch material for 1923 requirements, and the lists which are already in the hands of steel companies indicate unusually heavy buying. Some buying of girder rails has already started. The Providence traction lines placed 1500 tons of girder rails recently, and another eastern company is in the market for 800 tons more.

CAR ORDERS PLACED

Gulf Refining Co., 150 tank cars, to Standard Steel Car Co.
Chicago, Milwaukee & St. Paul, 5000 gondolas to Bettendorf Co.; 2000 box to Western Steel Car Co. and 500 automobile box to General American Car Co.
Central of New Jersey, 30 passenger to Standard Steel Car Co.
Long Island, 40 coaches to Standard Steel Car Co.
Pere Marquette, 1500 box to Pressed Steel Car Co. and 500 hoppers to Ralston Steel Car Co.
Sterling Salt Co., 30 mines, to Pressed Steel Car Co.
Baltimore & Ohio, 500 box, to Hamilton Car Co., Newark, O.

CAR ORDERS PENDING

Louisville & Nashville, 250 hopper repairs, pending.
Chicago, Milwaukee & St. Paul, 500 stock cars, bids asked.
Shawmut & Northern, 1000 box, bids asked.
Pacific Fruit Express, 5000 refrigerator, under consideration.
Philadelphia & Reading, 50 suburban, bids asked.
Gulf Smokeless Coal Co., 150 mines, bids asked

Let Contract for Idlers

Contracts for idlers to be used in connection with the conveying system to be built at the Colonial dock of the H. C. Frick Coal Co. have been placed with the Stephens-Adamson Mfg. Co., Aurora, Ill. The order aggregates between $200 000 and $300,000. No action yet has been taken toward closing contracts for the drying and its auxiliary equipment. A similar conveying system 15 miles in length for the National Mines at Sygan, Pa., now is under construction by the H. C. Frick Coal Co.

Report Basic Sale

Youngstown, O., Nov. 28.—The sale of 1000 tons of basic pig iron at $27.50 per ton valley furnace to a Pittsburgh district melter was reported here this morning. An inquiry for 5000 tons at lower quotations was said to have been refused.

Concrete Bar Needs Large

Seasonal Demand Exceeds Previous Years—Small Lot Buying Active with Occasional Large Tonnages Placed—New Inquiry Brisk

REINFORCING BAR PRICES, PAGE 1456

Chicago, Nov. 28.—In spite of freezing weather, contracting for reinforcing bars continues unabated. Not only are important tonnages being placed with sellers and total sales of large and small lots keeping up at a rate comparable with the summer season, but new projects continue to come out. In fact, the present situation is fully as active as has been met in a long time and far exceeds any autumn in the memory of those interested in this department.

Prices appear to be stiffening, and while most business has been moving recently on the basis of 2.00c, Chicago mill, and 2.25c, Chicago store, it seems likely that the former quotation of 2.50c, store, will be reached within a short time. It is understood reinforcing bar sellers have been quoted a higher price for first quarter than has applied to last quarter, and this has served to give strength to the market.

Shading Is Limited

New York, Nov. 28.—Current prices on concrete reinforcing bars for mill shipment range from 1.95c to 2.10c, base Pittsburgh. As far as known, the minimum price with practically all of the makers is 2.00c. Only odd lots, at secondhand, are involved in such shading as is being done. Current demand is far from active but is good considering the season.

Few Jobs Are Let

Pittsburgh, Nov. 28.—Some additional small awards in concrete bars are noted this week and a few more are up for attention. The market lacks life as regards large tonnages and the possibility is that the larger projects are held up until next spring. The range of market quotations has narrowed somewhat and this week concrete bars are quoted at 1.95c to 2.00c, base Pittsburgh.

Large Orders Are Absent

Cleveland, Nov. 28.—Orders for concrete reinforcing bars, represented by contracts for new construction, have been lacking in this immediate district this past week, but 250 tons was booked by the Cleveland office of the Concrete Steel Co., 150 tons for Indianapolis and 100 tons for Louisville, Ky. The outstanding prospective business here is bars for numerous school projects, the aggregate of which is expected to run into considerable tonnage. Several other projects are pending but no awards have been made. Prices remain unchanged at 1.95c to 2.00c, Pittsburgh at mill.

CONTRACTS PLACED

Awards reported this week	6,260 tons
Awards reported last week	3,445 tons
Awards reported two weeks ago ..	4,175 tons

1200 tons for building for Terminal Refrigerating Warehouse Co., Washington, to Dietrich Bros., Baltimore.

900 tons for buildings for Star Motor Co., Flint, Mich., to Truscon Steel Co.

900 tons for building for Chevrolet Motors Co. at Buffalo. Originally reported as having gone to Truscon Steel Co., finally awarded to Corrugated Bar Co.

600 tons for additions to Chevrolet Motor Co. plant, Norwood, O., to Kalman Steel Co.

560 tons for Akuitania hotel, Chicago, to American System of Reinforcing.

350 tons for addition to St. Francis convent, Dubuque, Iowa, to Concrete Steel Co.

300 tons for service building for Dayton Power & Light Co., Dayton, O., to Kalman Steel Co.

200 tons for highway work in Missouri, to Corrugated Bar Co.

200 tons for highway work in Missouri, to Concrete Steel Co.

150 tons, plant for American Can Co., Indianapolis, to Concrete Steel Co.

150 tons, building for Bank of Italy, Bakersfield, Cal., to Edward L. Soule Co.

150 tons for high school at Laporte, Ind., to Concrete Steel Co.

100 tons for Chicago Trust Co. building, Chicago, to Kalman Steel Co.

100 tons for Glen Lake sanitarium, Oak Terrace, Minn., to Corrugated Bar Co.

100 tons for highway work in Kansas, to Corrugated Bar Co.

100 tons for school at East Superior, Wis., to Concrete Steel Co.

100 tons, plant for Louisville Gas & Electric Co., Louisville, Ky., to Concrete Steel Co.

100 tons for building for Garrett Biblical institute, Chicago, to Joseph T. Ryerson & Son.

CONTRACTS PENDING

1500 tons for highway work in St. Louis county, Minn., near Duluth, pending.

1100 tons for filtration plant, Indianapolis. General contract to Hancock Brothers, Louisville.

1000 tons, government hospital buildings, Livermore, Cal., bids close Dec. 11.

700 tons for Rich building, Atlanta. General contract to Selden-Breck Construction Co., St. Louis.

500 tons for Ford assembly plant, South Chicago, bids opened Dec. 1.

300 tons, Providence hospital, Sacramento, Cal., general contract to Mathews Construction Co.

300 tons for garage for city of Newark, N. J., pending.

240 tons for First avenue bridge, Sterling, Ill., bids to be readvertised.

200 tons for Missouri Pacific railroad construction at Lexington, Mo., pending.

200 tons, high school, Carrick, Pa.; bids in.

200 tons for high school at Yonkers, N. Y., pending.

150 tons for office building for Thorpe Bros., Minneapolis, pending.

150 tons for high school at Patchogue, L. I., pending.

125 tons, Butler Memorial hospital, Butler, Pa.; bids closed Nov. 27.

125 tons, addition to Ward Baking Co. building, Pittsburgh; bids in.

114 tons, road construction, Santa Barbara national forest, Cal., bids close Dec. 24.

Ferro Resales

Reported in East but Are Not Market Factors—Some English Sold

FERROALLOY PRICES, PAGE 1456

Philadelphia, Nov. 28.—More than 1000 tons of domestic ferromanganese was sold in the past week at $100 furnace. About 300 tons of English material bought for speculation some months ago was sold at $100 tidewater. Several hundred tons were sold at resale at $98 and $95 but not much resale is obtainable as consumers generally have small stocks and are holding what they have. Consequently the latter prices are not regarded as of importance. Incidentally the 1500 tons of ferromanganese reported sold last week as domestic really involved English metal bought some months ago for resale. New inquiry is small.

Purchases Are Larger

Pittsburgh, Nov. 28.—Purchases of ferromanganese in larger tonnages than have been present in negotiations for several weeks past are featured in this week's ferroalloys market. A large independent steel company which closed on between 1500 and 2000 tons with one producer 10 days ago, has purchased more in another direction, around 1000 tons. While a few consumers have ferromanganese coming in on old contracts for their needs during the next three to six months, others find their estimates short of requirements under increasing operations. These have come into the market for various sized tonnages for shipment during December and several have bought into first quarter. Among these orders this past week are two aggregating in excess of 2000 tons, in addition to the fairly large number of small orders for prompt shipment involving 50 to 100 tons each. All this business has been taken by domestic producers at $100, base; that is, they are using the seaboard freight rate of $4.79 to Pittsburgh instead of a freight rate of $4.91 from their furnace. A fairly large number of new inquiries also are current, involving 50 or 100 tons each, although some of larger dimensions are noted, one maker receiving 10 such in a single mail. The Crucible Steel Co. of America ordered 600 tons of the 80 per cent grade, 300 tons for prompt delivery, and is understood to have been placed through its New York office.

In connection with spiegeleisen, a single carload order now and then is noted. It is expected that within the next few weeks inquiries for first quarter requirements will come out. Prices are unchanged at $36 to $37, the latter being paid for a carload of 19 to 21 per cent material this week. These levels practically are untested.

The Andrews Steel Co. closed on a small lot of ferrovanadium at a trifle under $3.50, the order going to a seller not ordinarily a factor in this market. Producers are firm on the basis of $3.50. In connection with ferrotungsten, some slight activity is noted in small lots at between 90 and 95 cents per pound although at the present time no new inquiries are out. Ferrosilicon is firm at $80, freight allowed, and middle interests easily are able to obtain $81.50 or $82. Higher prices prevail on ferrochrome, 13 to 14 cents representing the market instead of 12 to 13 cents.

Pipe Jobbers

Urge Deliveries As Their Stocks Dwindle—Expect More Buying

PIPE PRICES, PAGE 1456 AND 1520

Pittsburgh, Nov. 28.—Because demands made upon jobbers, mainly for standard merchant pipe in the buttweld sizes, are so heavy, it is impossible for them to accumulate a backlog. This keeps them pressing producers for deliveries but the demand is so varied they have to spread their output. A jobber who should have four or five carloads weekly now receives only one carload. Lately the situation has become so acute that jobbers ask for specific sizes. Mills are filled up for 60 or 75 days ahead and in fact those who practically allocate their output, have specifications now in hand for

as much as they can produce in five or six months. In lapweld sizes the situation is a trifle less acute. Several line pipe tonnages come up involving small lots of 100 to 1000 tons each, with numerous small requirements of the 4 to 14-inch sizes. Producers believe that in the near future some 4000 or 5000-ton lots will come out. Oil well casing orders from jobbers are regularly received. Since drilling activity is fairly well sustained and each well requires four or five carloads of assorted pipe, they have to maintain a fairly good stock to supply demand as it arises.

Some Inquiries Are Out

Chicago, Nov. 28.—Conditions in the cast iron pipe market at Chicago continue quiet, although some inquiry is coming out after a dull period extending over several weeks. Bids will be opened Nov. 29 at Chicago on 1500 tons and Nov. 28 at Mt. Prospect, Ill., on 400 tons. The National Cast Iron Pipe Co. has been awarded 200 tons at Hanover, Ill. Pipe shops are in a most confortable position, with sufficient tonnage on books to operate well through the winter, and the necessity of providing stock to build up reserves for next year's shipments. Prices remain steady at about $43, Birmingham.

Operations Keep Up

Birmingham, Ala., Nov. 27.—While the season for cast iron pipe is on the wane, plant operation is steady, and a few lettings are still coming in. Quotations have not been changed recently but attractive tonnage can command a lower price, it is stated. Soil pipe plant demand has slackened up considerably.

Sheet Mill Operation in Valley Declines

Youngstown, O., Nov. 28.—With the exception of a 1 per cent loss in sheet mill operations, activity throughout the Mahoning valley is substantially the same as for the two previous weeks. Lack of shipping facilities continues and while stocks of sheets and other commodities have been reduced somewhat considerable finished material will have to be moved before operating schedules can be expanded.

Independent open-hearth operations are at 86 per cent of capacity representing 44 active units. The Republic Iron & Steel Co. is charging 12, the Brier Hill Steel Co. and the Youngstown Sheet & Tube Co. 10 each, the Trumbull Steel Co. seven and the Sharon Steel Hoop five.

Sheet mill activity decreased from 88 to 87 per cent. Participants this week include the Brier Hill Steel Co. with 28 units active; the Trumbull Steel Co. and the Youngstown Sheet & Tube Co. with 15 each; the Newton Steel Co. with 10; the Republic Iron & Steel Co., the Falcon Steel Co. and the Mahoning Valley Steel Co. with eight each; and the Sharon Steel Hoon Co. with five or a total of 97 hot mills.

In addition the Republic Iron & Steel Co. has five finishing and six pipe mills under power and its bessemer converter blowing; the Sheet & Tube Co. has nine pipe and a 9-inch merchant mill active together with its rod, wire and bessemer departments; the Trumbull Steel Co. 16 hot tin mills at its Liberty and Main works; and the Brier Hill Steel Co. two plate mills.

Chicago Operations Hold

Chicago, Nov. 28.—Operation of steel plants at Chicago is relatively unchanged from previous weeks. Inland Steel Co. has reached a range of 70 to 75 per cent of capacity. It does not expect to go beyond this rate until after the winter. Illinois Steel Co. continues at 78 per cent of capacity, with 18 blast furnace stacks active. Both interests, as well as smaller companies, due to low fuel supply, fear that severe weather conditions may force partial closing down at some time during the winter.

Takes Bearing Contracts

Contracts for steel mill type roller bearings have been taken by the Hyatt Roller Bearing Co., New York, to equip 115 charging cars for the Bethlehem Steel Co., 75 charging cars and 65 ingot cars for the Wisconsin Steel Co., 270 ingot cars for the Youngstown Sheet & Tube Co. and all mill tables on the 11-inch merchant bar mill of the Fairfield plant of the Tennesse Coal, Iron & Railroad Co.

The Nonferrous Metals

Zinc Recovers, Depending Largely on London—Copper Firm and Tin Higher—Lead Changes Little

	Copper: Electro delivered	Copper: Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Nov. 22.....	13.87½	14.00	36.25	7.15	7.05	22.00	6.50	32.00
Nov. 23.....	13.87½	14.00	36.00	7.15	7.00	22.00	6.50	32.00
Nov. 24.....	13.87½	14.00	36.00	7.15	6.85	22.00	6.50	32.00
Nov. 27.....	13.87½	14.00	36.62½	7.15	7.00	22.00	6.50	32.00
Nov. 28.....	13.87½	14.00	36.62½	7.15	7.05	22.00	6.50	32.00

†Outside market quotation.

NEW YORK, Nov. 28.—A declining tendency ruled in the metal markets last week until Friday, when lead became stronger and reached the bottom of its reaction from the recent rapid climb. All of the metals have been firm to strong in the past few days.

A little business in copper for export has been going, with scattered domestic sales. In the meanwhile shipments of copper on contract continue heavy especially for use in this country. It is estimated total November shipments will run close to 170,000,000 pounds, or near the top record of the year. Brass and wire mills are well booked, while foundry trade is more irregular. Prices continue firm at 13.87½c to 14c delivered, with casting 13.40c to 13.50c refinery.

The zinc market has been depending much upon London lately, with little new home buying but shipments to domestic users on contract continuing heavy. Producers have not been anxious to sell, with most of the low prices on resale metal. The market has recovered to well above 7c St. Louis with prospects of more export business.

The situation in lead has changed little, the market soon recovering from a slight easiness, and shipments to nearly all classes of users continue large. The American Smelting company put its prices up to 7.10c New York, and 6.90c St. Louis last Friday.

Tin, after its slump last week, has been firmer, and yesterday went up and remained higher today though London is slightly easy. A scarcity of spot metal in New York is the cause, and futures have remained steady. However, as much tin is afloat the scarcity of spot probably will be very temporary. The world situation continues fairly strong.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled 24 oz., min	31.50
High brass	18.50
Zinc, ga. 9 to 18 (plates ½c less)	9.25 to 9.50
Lead, full sheets (cut, ¼c more)	10.25
Aluminum, base 18 ga. and up	36.40
SEAMLESS TUBES	
High brass	23.00
Copper	24.75
RODS	
High brass, round, ¼ to 2½ inch	17.00
Naval brass rod	19.00 to 19.50
WIRE	
Copper	15.50 to 16.00
High brass	19.00

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	8.50
Chicago	9.50
HEAVY YELLOW BRASS	
New York	6.25 to 6.50
Chicago	7.50
Cleveland	6.00 to 6.50
ZINC	
New York	4.00 to 4.25
Cleveland	4.00 to 4.50
HEAVY COPPER AND WIRE	
Cleveland	11.25 to 11.75
New York	11.00 to 11.50
Chicago	11.75
RED BRASS TURNINGS	
New York	7.75 to 8.25
Cleveland	8.00 to 8.50
Chicago	8.50
YELLOW BRASS TUBING	
Cleveland	6.00 to 6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.75 to 7.00
Chicago	7.50
ALUMINUM BORINGS	
Cleveland	7.00 to 9.00

Midvale Merged with Bethlehem

All Properties, Except Ordnance Plant at Nicetown, Are Acquired Through Method of Purchase Approved by Attorney General in Bethlehem's Acquisition of Lackawanna—President Grace Explains Transaction

NEW YORK, Nov. 28.—Acquisition of the Midvale Steel & Ordnance Co. by the Bethlehem Steel Corp. was announced Friday, Nov. 24, by E. G. Grace, president of Bethlehem. Prior to the announcement there had been rumors that such an event was impending, but the announcement was unexpected. It was the opinion in well-informed quarters that there would be no more mergers in the steel industry until there had been a final disposition of the federal trade commission's complaint concerning the consolidation of the Lackawanna Steel Co. and the Bethlehem corporation.

In announcing the Bethlehem-Midvale merger, President Grace explained that the negotiations had been under way for only three weeks. He said that he spoke with entire sincerity when he denied the reports current some time ago that Bethlehem was to take over Midvale.

"As a result of the speed and secrecy with which we worked," he said, "we have been able to eliminate speculation in stocks."

Merger of the Bethlehem and Midvale interests is to be accomplished in the same way that Bethlehem merged with Lackawanna; namely, Bethlehem has contracted to purchase the plants and other assets of the Midvale company. Under the agreement which was reached by the principals, Mr. Grace for Bethlehem and W. E. Corey for Midvale, and approved by the directors, Bethlehem will take over all of the Midvale and Cambria properties excepting the ordnance plant at Nicetown. The Nicetown works will be operated by a separate company now being organized, but in no way to be connected with Bethlehem. Mr. Grace said that Bethlehem's capital, prior to the taking over of Midvale, was $156,000,000 in bonds, $65,000,000 in preferred stock and $82,500,000 in common stock.

Mr. Grace said all negotiations were transacted solely between Mr. Corey and himself. Mr. Corey, he said, would become a member of the Bethlehem board of directors. As to other plans which Mr. Corey has in mind, Mr. Grace said, he preferred to have the former speak for himself.

Attorney General's Ideas Fulfilled

Replying to further questions, Mr. Grace said that the merger with the Lackawanna company was in accordance with the ideas of the attorney general and met with that official's aproval. The same ideas have been followed out in the Bethlehem-Midvale merger. Mr. Grace anticipates that the federal trade commission will make an investigation of the Midvale purchase in the same way as it is investigating the Lackawanna purchase.

By the acquisition of the Midvale company, Bethlehem's ingot capacity is increased from 4,890,000 to 7,600,000 tons. Bethlehem has further rounded out its line of products and now is in a position to compete in a territory which before it did not not reach extensively.

Mr. Grace's announcement issued Nov. 24 follows:

"The board of directors of Bethlehem Steel Corp., at a special meeting held this afternoon authorized contracts for the purchase of the plants and other assets of Midvale Steel & Ordnance Co., and of Cambria Steel Co., excepting the ordnance plant and other business located at Nicetown, Pa., and assets appurtenant thereto.

"In payment for the properties to be acquired, Bethlehem Steel Corp., besides providing for the assumption of the bonds and other indebtedness of the Midvale and Cambria companies (excepting current liabilities appurtenant to the operation of the Nicetown plant), will issue about $97,650,000, par value, of the Bethlehem common stock, of which $95,000,000, par value, will go to the Midvale company for distribution on dissolution to its stockholders, and the balance to the holders of the stock of Cambria not held by Midvale. As a result of these purchases the stockholders of the Midvale company will receive for each two shares of $50 par value, of the Midvale company stock, $95, par value, of the Bethlehem common stock, together with a pro rata share of the stock of the new corporation to which the Nicetown plant and the assets appurtenant thereto are to be transferred.

"The board of directors of Bethlehem Steel Corp., has authorized these additional acquisitions in pursuance of its policy of building up a complete line of steel products which it has followed ever since Mr. Schwab and his associates became interested in Bethlehem. Through the acquisition of the properties of the Midvale and Cambria companies, Bethlehem will acquire plants at Contesville and Johnstown, Pa., and Wilmington, Del., and important developed iron ore properties in Michigan and Minnesota, as well as developed coal properties in Pennsylvania. The ability to distribute and mix the Midvale coal and ores with Bethlehem's present coal and ore supplies will be of much advantage to both sets of properties in that operating costs can be reduced.

Acquires New Lines of Steel

"The acquisition of the Midvale and Cambria properties will give to Bethlehem important lines of steel products which it does not now manufacture, such as wire rods, wire and wire products, steel freight and mine cars, steel wheels, boiler tubes, agricultural implement parts, etc., in fact, it will place Bethlehem in position to produce all the so-called commercial steel products with the exception of pipe and seamless tubes. For those Bethlehem is planning to build plants at one of its existing properties.

"Bethlehem's present annual ingot capacity of 4,890,000 tons will be increased to 7,600,000 tons by the Midvale-Cambria purchase.

"These acquisitions will constitute an advantageous development of Bethlehem

Capacity of Enlarged Bethlehem Steel Corp.

BLAST FURNACES

	No of Stacks	Annual capacity tons
Bethlehem	24	2,514,000
Lackawanna	9	1,440,000
Midvale	14	2,360,000
Total	47	6,314,000

STEEL WORKS

	Open hearths	Converters	Annual capacity tons ingots
Bethlehem	55	13	3,217,000
Lackawanna	24	4	1,840,000
Midvale	59	4	2,500,000
Total*	138	21	7,557,000

*Bethlehem also has three electric furnaces.

FINISHING MILLS

Product	Bethlehem-Lackawanna	Midvale	Annual capacity tons
Rails	1,256,000	255,000	1,511,000
Shapes	870,000	410,000	1,280,000
Merchant bars	516,000	400,000	916,000
Plates	400,000	715,000	1,115,000
Sheets	70,000	.....	70,000
Tin plate	100,000	.....	100,000
Wire rods	.....	120,000	120,000
Wheels	.....	52,000	52,000
Axles	.....	45,000	45,000
All other	1,038,000	160,000	1,198,000
Total	4,250,000	2,157,000	6,407,000

COKE OVENS

	By-product	Beehive	Annual capacity tons
Bethlehem	1054	...	4,490,100
Lackawanna	....	490	318,000
Midvale	612	...	1,300,000
Total	1666	490	6,108,100

geographically, in that they will supplement its present plants by a large steel plant with low cost production located at Johnstown, Pa., from which an economical distribution of its products can be made into the important Central West industrial fields, which Bethlehem cannot now advantageously serve.

"No increase in the aggregate indebtedness is necessary or contemplated for this transaction. With the additional common stock to be issued for the properties to be purchased and with the 8 per cent preferred stock converted into the new 7 per cent cumulative preferred stock, the approximate capitalization of Bethlehem Steel Corp., will be: $213,500,000 funded debt; $62,000,000 of 7 per cent preferred stock and about $180,250,000 of common stock.

"The combined investment in property and plant, less depreciation and depletion, will be about $465,500,000, and the aggregate net quick assets will be about $133,700,000.

"The stockholders' meetings and the other proceedings will require 60 to 90 days before the transaction can be concluded. In the meantime, the Bethlehem management will be acquainting themselves with operating conditions at the Midvale and Cambria properties so as to facilitate the taking over of the active management when the transaction shall have been ratified by the stockholders of the respective companies."

W. E. Corey, chairman of the Midvale company, in a formal statement touching upon the purposes of the consolidation and the benefits to be derived from it said:

"The officers and directors of Midvale Steel & Ordnance Co. have for a long time been convinced that a larger steel tonnage, a wider diversity and a better distribution of products than their corporation enjoys is essential to effect the savings in manufacturing, selling and administrative costs, and the economies in mining ore, coal and limestone, necessary to secure the best results in the steel business. The sale to Bethlehem has been arranged with these things in view."

The Midvale Steel & Ordnance Co. was incorporated in October, 1915, with an authorized capitalization of $150,000,000 and ingot capacity of 1,600,000 annually. Upon its incorporation the company absorbed the capital stock of the Midvale Steel Co., with its original plant at Nicetown, near Philadelphia, together with the Worth Bros. Co., at Coatesville, Pa., the Coatesville Rolling Mill Co., allied with Worth Bros., and the Remington Arms Co., of Delaware, also formed in 1915. In the following year control of the Cambria Steel Co., Johnstown, Pa., was acquired. At present Midvale owns 97 per cent of the stock of Cambria. The Midvale purchased the property formerly operated by the Diamond State Steel Co., Wilmington, Del., and organized the Wilmington Steel Co. in 1916. This subsidiary company was dissolved in 1918. The Remington Arms Co. of Delaware also was dissolved in July, 1918.

It is reported that the Bethlehem-Midvale merger interests are negotiating for the purchase of the Orient plant of the American Coke Corp., Uniontown, Pa., together with one or two other coke oven properties.

Bethlehem Buys Into Babbitt Ore Plant

BY ACQUIRING the Midvale Steel & Ordnance Co., the Bethlehem Steel Corp., adds to its holdings about 53,500,000 tons of iron ore in the Lake Superior district, contained in developed properties. Purchase of the Lackawanna Steel Co., by Bethlehem gave that corporation approximately 25,500,000 tons of ore. These acquisitions, with the Bethlehem's own ore tonnage, brings the total to around 228,000,000 tons of available ore, compared with 1,200,000,000 tons of reserves owned by the United States Steel Corp.

The estimates of the reserves of the Midvale, Bethlehem and Lackawanna interests, made by geologists and mining engineers in recent months, does not include Midvale's interest in the Mesabi Iron Co., which owns immense deposits of lean iron ore at the eastern point of the Mesabi range. These deposits are coming into more prominence, and in reality comprise some of the most valuable assets which flow to the Bethlehem corporation.

The Eastern Mesabi iron ore is in the form of magnetite. The deposits include about 1,200,000,000 tons of ore formation, averaging around 33 1/3 per cent metallic iron. About three tons of the material will have to be crushed, the ore separated out by magnetic means and sintered, to make one ton of shipping product. This represents about 400,000,000 tons of high-grade "manufactured ore" for blast furnace use. Of this, the Midvale company owns one-fourth. Added to the estimate of available iron ore, Midvale's interest here would raise the total possessed by the Bethlehem corporation to 328,000,000 tons. This total does not include some of the Bethlehem's ore deposits in Cuba which did not figure in the engineer's estimates owing to the fact that the structure of the ore precludes commercial use at present.

The Midvale company has had representation on the board of the directors of the Mesabi Iron Co., W. E. Corey, A. C. Dinkey and J. C. Agnew serving in this capacity.

The Mesabi Iron Co., expended in round figures $3,500,000 tons in building the sintering plant at Babbitt, Minn. The theoretical capacity of this plant, operating normally, is 1000 tons of sintered product in 24 hours. The plant, however, is not exactly "balanced" at present. That is, it has but one sintering unit, with a capacity of 500 tons in 24 hours, though the equipment for concentrating has the full 1000-ton capacity. It is assumed that the additional sintering unit will be added at an early date, as production develops certain points in regard to operation. The construction of 30 complete plant units, each with its complement of two sintering units, has been contemplated by the company.

The Midvale company also owns the Penn Iron Mining Co. operating the Penn mine on the Menominee range, containing 2,500,000 tons of ore. It has a one-sixth interest in the Hanna Ore Mining Co. operating various properties in the Lake Superior district, which gives it control of 4,000,000 tons. A one-seventh interest in the Scranton mine, Mesabi range, and Plymouth mine, Gogebic range, is equivalent to 5,000,000 tons; one-quarter interest in the Bennett, Mesabi range, 5,000,000 tons; one-half interest in the Mahoning, Mesabi range, 35,000,000 tons, and one-quarter interest in the Zenith Vermillion range, 2,000,000 tons.

Trade Commission May Join Merger Issues

Washington, Nov. 28.—Bethlehem Steel Corp.'s acquisition of the Cambria and Midvale properties came before the federal trade commission at its regular meeting Monday in the shape of a detailed statement of the proposal filed by counsel for Bethlehem. No action was taken Monday. It appears unlikely that the commission will reach final action at its Wednesday meeting, postponing any move the commission may make at least until Friday.

That the commission will act there seems to be little doubt. Consistency would compel that the complaint against the absorption of the Lackawanna Steel Co. by Bethlehem be followed by one against the acquisition of Midvale and

Cambria. Inasmuch as a hearing has not yet been held on the Bethlehem-Lackawanna complaint which was issued June 5, the procedure may take the form of amending the Bethlehem-Lackawanna complaint and thus join the issues.

With the financing of the consolidations the trade commission has no concern. Its vision is strained by the federal trade and Clayton acts, to determine if competition is being restrained and an unfair method of competition is being set up. Through its questionnaires and general inquiry instituted by the Bethlehem-Lackawanna complaint and the complaint against the abandoned Midvale-Republic-Inland merger the commission has at its disposal most of the needed facts.

By amending the Bethlehem-Lackawanna complaint to include the objections to the Bethlehem-Midvale consolidation more delay probably will result. Attorneys for the commission have not yet fixed a date for the Bethlehem-Lackawanna hearing but were expected to select some day early in January. Amending the complaint will necessitate allowing 30 days for the filing of a reply, and the conduct of the case will be altered somewhat by the new consolidation, thereby necessitating more preparatory work.

Hearings on Immigration To Begin Next Week

Washington, Nov. 28.—Hearings on proposed amendments to the 3 per cent immigration act will be opened by Chairman Johnson of the house immigration committee shortly after Dec. 5. Correction of quotas, proposed mental and health tests and putting up the bars to aliens who would be ineligible for citizenship are some of the proposals to be taken up. No increase in the number of permissible aliens is under consideration. Speaking of efforts to broaden the act to remedy the labor shortage, Chairman Johnson says:

"Some have thought that authority to carry approximately 50 per cent of incoming aliens on American ships, as provided by the subsidy bill, might be an entering wedge to be used later on for striking down the heavy restriction of immigration. But I think not. I believe the immigration laws will be made still more strict."

Although the President will address congress on a diversity of topics next Tuesday, including a reduction in freight rates, lowering of the cost of living, extension of rural credits, 1924 appropriations and kindered subjects, it is understood that he will not bring up immigration. There is every reason to feel, on the other hand, that the amendments to be submitted by Chairman Johnson will not go through at this session. The house may take favorable action but the senate seems likely to be tied in a bow-knot on the administration subsidy bill.

The house until tomorrow night will consider the subsidy bill, which is expected to pass without great difficulty. The last three days of last week were devoted to general discussion of the measure, and the first three days of this week to amendments, with a vote scheduled for late Wednesday. The outlook continues that the measure will be talked to death in the senate.

The department of commerce is using the present jam in import figures as a lever to get action on a bill transferring the bureau of customs statistics from the treasury department. The imports for October will not be available until between Dec. 20 and Jan. 1, it is stated. By placing the bureau in the department of commerce and enlarging it American industry would be benefited, Secretary Hoover's aides assert.

Roads Suffer from Too Much Control, Says Rea

Chicago, Nov. 28.—Freedom from certain government restrictions is necessary if the railroads are to meet the transportation needs of the country, Samuel Rea, president of the Pennsylvania railroad, told the Commercial club of Chicago in an address last week. He said:

"Long unremunerative returns are the chief cause of congestion. The political attacks on railroads followed by restrictive and repressive regulation by federal and state bodies, the pressure for reduced rates and the ruinously low investment returns allowed the railroads, for over a dozen years have kept railroad development in this country below normal requirements in new lines, yards, equipment and facilities. The low returns likewise have made it impossible to finance these necessities through the sale of capital stock or even of bonds.

"What will mitigate the burden and enable the country to gradually work back again to ample transportation service? Just begin by telling your state and national representatives and senators to stop tinkering with the railroads, as they will not be saved by legislation, but by freedom to manage their properties under minimum reasonable regulation and to earn a fair return."

Colorado Loss Larger

Operating losses of the Colorado Fuel & Iron Co., increased in the quarter ended with September. The total deficit was $131,463 against $18,430 in the second quarter and a loss of $810,868 in the corresponding period one year ago. The deficit for the nine months after interest, taxes, sinking fund and depreciation was $581,162 against $579,093 in 1921.

Beehive Coke Production Still Gaining

Production of beehive coke continued upward in the week ending Nov. 18, reaching 261,000 tons, or an increase of 15,000 tons over the week before, according to the estimate of the United States geological survey. This makes the year's output to date 6,310,000 tons as against 4,826,000 tons in the same period a year ago. How the week's production by states compares with other weeks follows:

	Nov. 18 1922	Nov. 11 1922	Nov. 19 1921
Pennsylvania and Ohio.	200,000	184,000	85,000
West Virginia	21,000	23,000	6,000
Alabama, Tennessee and Georgia	18,000	17,000	8,000
Virginia and Kentucky	11,000	13,000	7,000
Colorado and New Mexico	6,000	5,000	2,000
Washington and Utah.	5,000	4,000	3,000
United States total....	261,000	246,000	111,000
Daily average	44,000	41,000	19,000

Bituminous coal production in the week ended Nov. 18 was 11,213,000 tons compared with 10,147,000 tons in the week before and 8,871,000 tons in the corresponding week of 1921, according to the geological survey. Anthracite production in the week ending Nov. 18 also was greater, reaching 2,191,000 tons compared with 1,863,000 tons in the week before and 1,879,000 tons in the corresponding week last year.

Issues Bulletin on Ore

Washington, Nov. 28.—Continuous production of brown hematite in North Carolina the past five years has attracted attention to that state as a possible source of a larger supply, states the geological survey, which has issued a bulletin on the subject. Since 1917 about 126,000 tons of brown hematite has been taken out of the deposits in the western part of the state.

Takes Bids on Tubing

Washington, Nov. 28.—Seven bids were received on Nov. 22 by the navy department for the sale of approximately 10,000,000 pounds of steel tubes and tubing, that of DeNeal Samuel, Washington, for the entire lot being $22.43 per gross ton. The bid of the Barde Steel & Machinery Co., Seattle, for three lots was from $21.33 to $26.13 per ton. Bids were also received from S. L. Gabel, Bridgeport, Pa.; Lafee & Abraham, San Francisco; Jones-McKee, Inc., New York; N. E. Martin, Leola, Pa.; and the Seamless Tube Co., Auburn, Pa. The award has not yet been made.

Pig Iron Demand Lighter

Pacific Coast Mill Representatives Optimistic on 1923 Business—Independents Offer First Quarter Galvanized Sheets at 4.35c

San Francisco, Cal., Nov. 25.—Demand for iron and steel products during the past week has not been as heavy as usual. However, mill representatives appear well pleased with the volume and are decidedly optimistic regarding the outlook for 1923. The major development of the week was the offering, on the part of at least two independent sheet producers, to accept first quarter galvanized sheet tonnages at 4.35c base Pittsburgh. Building activity is being well maintained. Reports from Los Angeles show 2250 permits issued up to and including Dec. 14 with a valuation of $4,847,649 as compared with 2267 permits and a total of $5,708,092 for the corresponding period in October.

Pig Iron and Coke

During the past few weeks there has been no inquiries from consumers of foundry iron for any large tonnages. Sales have been confined for the most part to carload lots, and at prices ranging from $31 to $35 a ton c.i.f. San Francisco, duty paid, for a grade of foreign iron equivalent in analysis to Nos. 1 and 2 southern foundry. On round tonnages $28 a ton c.i.f. San Francisco, duty paid, can be obtained. Foundries in the southern part of the state are operating at a better rate than those in this district. The Union Tool Co., Torrance, is reported to have closed on 1000 tons of foreign iron running 1.25 to 1.75 in silicon, .4 in phosphorus, .5 in manganese and under .05 in sulphur at a price of $27.25 a ton c.i.f. San Pedro, duty paid.

Bars, Plates and Shapes

Local bar mill operators report a slight lull in demand for merchant steel bars and attribute it to the approach of inventory time. Prices for this class of material remain unchanged at 2.70c f.o.b. cars, San Francisco. Six out of twelve openhearths are in operation this week. Demand for concrete bars in small lots is good. At an election the city of San Francisco voted a $12,000,000 bond issue for public schools most of which will be utilized for constructing new schools.

Tank and pipe fabricators have inquiries out which in the aggregate involve heavy tonnages outstanding among which is 3600 tons for the Shell Oil Co. refinery and a reported tonnage of 7000 tons for tanks for the Pan-American Oil Co. The Baker Iron Works, Los Angeles, secured 420 tons for a pipe line for the city of Los Angeles. The Western Pipe & Steel Co. was awarded 100 tons for a pipe line for Fair Oaks. Two large pipe line projects are expected to come up for figures directly after the first of the year. The largest one involves over 8000 tons for 19 miles of 60-inch pipe for the Hetch Hetchy project and the other about 2400 tons of 24-inch pipe, 14 miles in length for Vallejo. While 2.40c c.i.f. San Francisco appears to be the minimum on the general run, 2.35c has been quoted in one instance on a round tonnage. On a Pittsburgh base this quotation would figure back under 1.75c.

Other Finished Material

The Los Angeles Railway Corp. awarded 1300 tons of 116-pound girder rails and 500 tons of 72-pound T rails to the Bethlehem Steel Co. The Southern Pacific Co. has an inquiry out for 500 kegs of ⅞ by 4½-inch track bolts, bids on which will close Nov. 27.

Although the leading interest on this date has not yet announced its sheet prices for first quarter at least two independent companies have offered to accept galvanized sheet tonnages for first quarter delivery at 4.35c base Pittsburgh.

While more activity is noted in the municipal cast iron pipe market private business is still quiet. Prices remain unchanged. The American Cast Iron Pipe Co. secured 3300 tons of 4 and 6-inch Class B for Los Angeles. Los Angeles will open bids on Dec. 24 for 265 tons of 16 and 20-inch. Lakeport will be in the market soon for 1000 tons of 4 to 10-inch and Modesta for 240 tons. All forms of wire products are in heavy demand.

Old Material

Although no large tonnages of cast iron scrap have moved of late the price is firm at $25 to $26 a ton delivered. Local rolling mills bought a total of 10,000 tons of melting steel at prices ranging from $12.50 to $13. delivered mill.

Warehouse Trade

Jobbers in this district report demand for all forms of iron and steel products good with galvanized sheets and pipe most active. One large interest states that this year's business to date has exceeded by 35 per cent that for the corresponding period of 1921.

Firm Prices

And Good Demand in Market—Scrap Is Active

Seattle, Nov. 25.—While the weak has brought no outstanding features in the iron and steel trade the aggregate of business is satisfactory in all branches of the industry. The tone of the market is firm and there is every indication that 1923 will develop a volume of business much greater than that of the present year.

Pig Iron and Coke

Prices are firm and demand continues good. The foundry trade is buying in small tonnages but the total is making a satisfactory showing. Importers are buying foreign pig iron as orders are placed by local interests, delivery being made in from 60 to 90 days. Fernie coke is being sold in increasing amounts with little interest shown in English coke. Domestic coke producers are trying to sell eastern coke on this coast but prices are out of line.

Bars, Plates and Shapes

Jobbers report a constant heavy demand for merchant bars while the steel mill is delivering a satisfactory total of small tonnages of reinforcing orders.

Contracts to be awarded in the near future of the city of Seattle include in addition to the Spokane street bridge, involving between 10,000 and 12,000 tons of steel.

The Isaacson Iron Works has received the contract for furnishing the steel to construct the frame of a boiler and pumphouse for the Associated Oil Co. at the latter company's new local terminal, to cost $1,000,000. It is proposed to erect one 3[illegible],000 barrel, one 30,000-barrel, one 10,000-barrel and one 5000-barrel additional storage tanks. Union Bridge Co., Seattle, has been awarded a 150-foot steel bridge, with concrete footings in Crook county, Oregon. Steel will be furnished by Minneapolis Steel & Machinery Co.

Tenders for constructing the steel ferry for the Canadian Pacific railway at Vancouver, B. C., have been forwarded to Montreal and the contract will soon be awarded. The cost is estimated at $250,000.

Other Finished Material

Sheets are in particularly strong demand. Jobbers report a shortage in large shapes, beams and channels, all of which items are being sold in good volume. Everything pertaining to logging and the lumber industry is in demand. Certain sizes of pipe are moving freely while building hardware shows increased turnover.

Warehouse Trade

Shortage in some items is hampering this branch of the trade and uncertain deliveries are also causing anxiety. Jobbers are buying in considerable volume, though awaiting price announcements for the first quarter. The volume of turnover for this month is in excess of the same period in October. It is announced semiofficially that freight rates by water will not be changed until the middle of next year although jobbers would like to see the present low rates on less than carload lots revoked.

Old Material

The domestic scrap market is very active while the export demand shows improvement. Both No. 1 cast is exceedingly scarce, supplies being considerably below the demand. Exporters of steel scrap have exhibited renewed interest, Japan still being a heavy buyer. This grade is strong at from $12 to $14. Cast iron is being quoted from $21 to $22, the market being almost cleaned. One buyer has just obtained about 6000 tons of scrap from the ruins of a large lumber plant and this is being rapidly sold.

Standard Oil Buys Welsh Plate

Closes with Swansea Mill for 150,000 Boxes of Tin Plate Around $4.41—Receives Sea Freight Concessions—Pittsburgh Fabricator Underbid on South African Transmission Tower Project—More Activity Abroad

Iron Trade Review Staff Cable

Euro-ean Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

Sterling—$4.52

LONDON, Nov. 27.—The Standard Oil Co. of New Jersey has purchased 150,000 boxes of tin plate and the business is understood to have gone to Richard Thomas & Co., Swansea, at about 19 shillings 6 pence ($4.41), base, plus special sea freight concessions from British ship owners. The market now is firmer. Some makers are asking £1 ($4.52) for first quarter.

A Pittsburgh fabricator may lose a 30,000-ton contract for electric transmission towers and overhead construction for South African railways. This interest quoted £75 ($339) per tower c.i.f. Cape Town, as against £72 ($325.44), quoted by a British interest. Americans also are competing for a 600-ton initial order for similar material for Bombay suburban lines.

Sagging inquiry from the United States for pig iron is counter balanced by considerable demand in the home market, first quarter sales aggregating upward of 50,000 tons. Prices show no advance except in hematite.

The North British Locomotive Co. has taken an order for 30 locomotives for the Great Indian Peninsular line, and Wm. Beardmore & Co., Ltd., has booked five locomotives for the Burmese railway. Glasgow is inquiring for 4200 tons of tramrails. Five thousand tons of Australian rails for the Victoria state lines probably will be awarded to the Broken Hill Proprietary Co. This is additional to 5800 tons already awarded, half to the Broken Hill company at £12 ($54.24) and half to Dorman, Long & Co. at £10 19s 9d ($49.66), both c.i.f., Melbourne.

Galvanized sheets present the most active feature of the British market. Prices are firm; British producers benefitting from the sold up condition of the continental mills and the rise in Belgian and French francs. German pig iron is lower by 2400 marks ($0.336), this being the first drop in the price in months.

Business Picks Up Following British Elections

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$4.47

BIRMINGHAM, Eng., Nov. 17.—Iron and steel business booked during the past week has been larger than for a long period. The October statistics issued by the National Federation of Iron and Steel Manufacturers show that the rate of expansion is well maintained and the signs are that November will show a still further improvement. The production of pig iron in October was 481,500 tons and of steel ingots and castings 565,200 tons. It is pointed out that these figures are the best since the coal strike of last year, although in regard to pig iron it represents only 56 per cent of the average monthly production of 1913 which amounted to 855,000 tons. The disparity is not so great in regard to steel, the 1913 average being 638,600 tons. The present output compares favorably with that of 1921 when the average was 302,200 tons, but is still a long way behind the high production of 1920, on a level of 755,600 tons.

In nearly all departments improvement is reported. In sales of pig iron the lead is taken by makers on the west coast who continue to do a large volume of American business. One firm has booked 30,000 tons of Barrow iron for shipment to American buyers. All the West Coast companies are getting a share of the transatlantic business, aggregating a fairly large tonnage. The general view in that district is that the American demand will be maintained throughout the winter at least. A fair amount of business is being done with the continent. Two additional furnaces have been lighted, one at Whitehaven and the other at Millom, making a total of 15 in the district now operating. It is generally expected that several more will be at work before the end of the year. The weak feature is the fact that the bulk of the business is foreign, local steelworks taking very little of the Barrow material.

While the position has improved at Middlesbrough, no increase in output is in prospect. Makers are fairly satisfied with the position, hematite having been sold up to March. Makers of foundry iron are well booked to the end of the year. Scotland is taking larger quantities and the local steelworks are coming forward with much better orders. No. 3 foundry iron is maintained at £4 12s 6d ($20.67). East coast hematite has been advanced to £4 3s 6d ($18.66). Coke continues firm with an upward tendency.

Prices of British steel are resisting fairly well the destructive continental foreign competition resulting from the low state of exchanges. The competition from Belgium has been exceptionally severe, due to the very low value of the franc. Joists have been offered this week from Antwerp at £6 5s ($27.93) f.o.b. or £7 11s ($34.64), delivered in Birmingham. Considerable tonnages have been taken in anticipation of building extensions. These prices compete with the British figure of £8 15s ($39.11). Similarly, in semifinished material the British makers are well undersold. A lot of billets has been bought at £6 5s ($27.93). Belgium has taken practically all the trade it can handle. Some leading firms have declined further commitments for the remainder of the year. It is remarkable that the British houses are practically ignoring this competition, making no attempt to meet it. A number of the steelworks have raised their prices to £7 2s 6d ($31.84) and upward. At the Birmingham meeting, Nov. 16, buyers were unable to place orders for billets at £7 ($31.29).

There are signs that the railways are at last coming into the market. Leading lines are placing orders for bridges calling for large quantities of steel. Some projects for widening lines are coming to the front, one contract has been placed.

In the Middlesbrough area the tone is better than for many months. A large volume of inquiry has been received, a fair proportion of which have yielded actual business. Some good shipbuilding orders have been placed on the Tyne and Tees.

For the time being Barrow-in-Furness is not particularly busy, some of its rail and merchant mills having suspended. This is believed to be a temporary condition. Some big shipbuilding orders have been placed there and others are expected. The new government may be depended upon to place as quickly as possible the orders for the battleships already authorized. The Dowlais steelworks of Guest, Keen & Nettlefolds, which lately restarted after a period of idle-

Current Iron and Steel Prices of Europe

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£	s	d
SEMIFINISHED STEEL				
Billets, soft steel	28.81	6	7	6
Sheet bars	28.81	6	7	6
Wire rods	44.07	9	15	0
FINISHED STEEL				
Steel bars, England, ½ to 3-inch	37.29	8	5	0
Steel bars, England, ⅝ to 3-inch, for export	35.03	7	15	0
Plates, ship, bridge and tank, England	38.42	8	10	0
Plates, ship, bridge and tank, England, for export	36.16	8	0	0
Plates, ship, bridge and tank, Scotland	37.29	8	5	0
Plates, ship, bridge and tank, Scotland, for export	35.59	7	17	6
Beams, England	37.29	8	5	0
Beams, England, for export	33.90	7	10	0
Beams, Scotland	36.16	8	0	0
Beams, Scotland, for export	33.90	7	10	0
Sheets, black, 24 gage	48.59	10	15	0
Sheets, galvanized, 24 gage	81.36	18	0	0
Rails, 60 pounds and over	36.16	8	0	0
Rails, 60 pounds and over, for export	32.77	7	5	0
Tin plate, base box, 108 pounds	4.46	0	19	9
Steel hoops	46.33	10	5	0
Steel hoops, for export	45.20	10	0	0
PIG IRON				
Hematite, east coast, mixed numbers	21.13	4	13	6
Hematite, west coast, mixed numbers	21.13	4	13	6
Basic Middlesbrough	18.08	4	0	0
No. 3 foundry, Middlesbrough	20.90	4	12	6
No. 3 foundry, Derby, Leicester, Nottingham	18.64	4	2	6
No. 3 foundry, Northamptonshire	18.08	4	0	0
No. 3 foundry, Staffordshire	18.08	4	0	0
No. 3 Scotch foundry	22.03	4	17	6
Ferromanganese, 76 to 80 per cent	67.80	15	0	0
Ferromanganese, 76 to 80 per cent, for export	64.41	14	5	0
COKE				
Yorkshire furnace	5.08	1	2	6
Yorkshire foundry	6.21	1	7	6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	12.38	95,243
Foundry, No. 3, Oberhausen	10.31	79,272
Bessemer Stahleisen, Siegen	12.29	94,575
Foundry, No. 1, Oberhausen	12.29	94,575
Luxemburg foundry	9.69	74,562
COKE		
Ruhr furnace	1.54	11,872
Ruhr foundry	1.61	12,354
SEMIFINISHED STEEL		
Billets	16.19	124,500
Sheet bars	17.36	133,500
Wire rods	16.86	129,700
FINISHED STEEL		
Standard rails	11.96	92,000
Merchant bars	16.74	128,740
Structural shapes	19.77	152,100
Ship plates	22.49	173,000
Medium plates, 3 to 5 millimeters	25.38	196,000
Sheets, below 3 millimeters	27.95	215,000
Tin plate	48.26	371,200
Plain wire	19.08	139,110
Bands and strips	23.22	178,600

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	21.89	310
Basic bessemer, Loraine	17.30	245
Foundry, Longwy, No. 3, sand-cast	16.59	235
Foundry, Longwy, No. 3, chill-cast	17.30	245
Ferromanganese, 76 to 80 per cent	66.72	945
COKE		
French furnace	6.50	93
German furnace, f.o.b. frontier	6.71	95
French foundry	8.75	124
SEMIFINISHED STEEL		
Blooms	22.59	320
Billets	24.71	350
Sheet bars	26.83	380
FINISHED STEEL		
Standard rails	38.83	550
Merchant bars	31.77	450
Angles	33.47	475
Normal beams and profiles	33.47	475
Plates, ship and tank, 10 millimeters and thicker	43.07	610
Plates, bridge and tank, 5 to 10 millimeters	45.89	650
Sheets, black, 3 millimeters	48.71	690
Sheets, blue annealed, 2 millimeters	51.54	730
Shafting, cold-drawn, 40 to 60 millimeters	58.25	825
Bars, 2 per cent nickel steel	98.84	1400

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	15.38	235
Basic open-hearth, Belgian	15.72	240
Gray forge, Belgian	15.38	235
Foundry, No. 3, Belgian	17.69	270
Foundry, No. 3, Luxemburg	17.36	265
Foundry, No. 3, Lorraine	17.36	265
SEMIFINISHED STEEL		
Blooms	21.29	325
Billets	22.60	345
Sheet bars	23.58	360
Wire rods	34.06	520
FINISHED MATERIAL		
Standard rails	29.15	445
Merchant bars	28.49	435
Normal beams and profiles	25.22	385
Plates, 5 millimeters and thicker	30.13	460
Sheets, black, 3 millimeters	33.41	510
Sheets, galvanized, 1 millimeter	92.36	1410
Plain wire	42.25	645
Galvanized wire	58.26	890
Wire nails	33.08	505

All prices are f.o.b. furnace or works.

ness through lack of trade, has obtained rail orders sufficient to occupy it for some months.

The full effect of Belgian competition is being felt in the Staffordshire iron trade. No. 3 Belgian iron is still obtainable at around £7 10s ($34.52) and the saving of £2 ($8.94) per ton has proved an irresistible temptation to a number of Staffordshire interests making large use of iron and steel.

The makers of galvanized sheets are successfully maintaining their advances, £17 10s ($49.22) being now the usual quotation. Some of the Welsh works are well booked into the spring and look forward to still higher prices, especially in view of the constant increase in spelter values.

Demand for Welsh tin plate has justified the recent small increase in selling prices, quotations now ranging between 19 shillings 6 pence ($4.35) and 19 shillings 9 pence ($4.41) per base box. Oil plates are called for in large quantities.

French Market in Disturbed Condition

European Staff Special

Office of IRON TRADE REVIEW,
224 Rue de Rivoli,

PARIS, Nov. 17.—Present violent fluctuations in exchange have disturbed the French iron and steel market. The pound sterling was quoted at 73 francs for a short time, this being

Franc—$0.065

the highest point reached since the franc began depreciating. The immediate result of this situation is a strong tendency toward a rise in prices of most commodities, and an increase in living costs. The situation is slightly alleviated, however, in that the export business has been stimulated by the fall of the franc. On the other hand, Germany is again seeking business in

foreign markets. The low value of the mark is forcing German manufacturers to sell their products in foreign markets.

French production of iron and steel is decreasing due to the shortage of coke. Deliveries of reparations coke from the Ruhr for October were 55,000 tons short of the figure fixed by the reparations commission. Receipts from the French coke plants amounted to only 9000 tons, or less than half of the amount expected and out of 25,000 tons which were to be procured in Belgium, only 9500 could be obtained. Consequently 20,000 tons was ordered in England at the most unfavorable time for French interests, the sterling then being around 70 francs. The want of coke is handicapping seriously blast furnace operations in the East and Lorraine and several stacks have had to be blown out.

The demand for pig iron is brisk and stocks are rapidly decreasing. The price of 250 francs ($16.25) per metric ton has been reached for No. 3 chill-cast foundry pig. The hematite department is satisfactory now that English competition is no longer felt. Quotations range from 300 francs ($19.50) to 350 francs ($22.70).

The steel market is rather spotty. Makers of finished products are not anxious to take on large tonnage for future specification. Many orders for quick delivery have been received from England. Prices are firm and deliveries are becoming more and more extended. The plate and sheet department is influenced by the irregularities of exchange. Belgium has succeeded in getting a foothold in the northeast of France. Germany has also obtained a few orders. Sales by the Comptoir des Toles & Larges Plates during October amounted to 65,000 tons or practically the same as for September. The following prices have been quoted by a mill in the Loire district for open hearth quality: 3 millimeter sheets, 750 francs ($48.75); 4 millimeter sheets, 730 francs ($47.40); 5 millimeter plates, 710 francs ($46.20); 6 millimeter plates, 700 francs ($45.50); 8 millimeter plates, ($44.20), 9 millimeter plates 650 francs ($42.20), all per metric ton. Orders have been received from the shipyards.

Belgian Pig Iron Market Still Active

European Staff Special

BRUSSELS, Nov. 17.—The situation of the Belgian iron and steel market is gradually becoming stabilized. Rising prices, however, are caused more particularly by increased production costs and higher prices for raw materials, than by improved market conditions. The recent fall in Belgian exchange has proven favorable to export business. Semifinished steel products and beams are offered for export to England under English domestic prices. An order for 300 tons of cast iron pipe has been awarded to the Compagnie Generale des Conduites d'Eau, Liege, for the water supply system of Santiago, Chile.

The Societe Cockerill which recently assisted in the financing of a new company in Poland for manufacturing locomotives has been awarded an order for 100 locomotives for the Polish government to be delivered before 1924. Reconstruction of the Cockerill plants at Seraing is nearly completed and three stacks now are blowing; the daily output averages 700 tons.

Franc—$0.06

The pig iron market is active. Production for September exceeded the August output by 9000 tons. Prices are being adjusted upward. Foundry pig is now quoted around 270 francs ($16.20) per metric ton. Many inquiries are being received from the United States.

Demand for semifinished products is growing and England continues to place large orders in Belgium, particularly for 2-inch billets. The structural steel department is dull. German competition on plates and sheets is very keen, especially on the heavier gages.

The following prices per metric ton f. o. b. Antwerp have been quoted recently for export: Merchant bars, 430 francs ($25.80) to 440 francs ($26.40); hoops and bands, 650 francs ($39) to 660 francs ($39.60); normal beams, 380 francs ($22.80) to 390 francs ($23.40); ship and tank plates, 450 francs ($27) to 460 francs ($27.60); wire nails, 490 francs ($29.40) to 510 francs ($30.60).

Stinnes Invades Japanese Market

Foreign Special Service

TOKIO, Japan, Nov. 13.—Following closely on the strong drive being made by the Indian furnaces for a share of the Japanese market on a permanent basis, the Hugo Stinnes interests of Germany are making a determined bid for the steel trade in Japan. The agency of Stinnes, which was recently established here, has announced that a new vessel will bring a large tonnage of steel from Hamburg in a few months. The uneasiness in the iron and steel trade is further accentuated by this announcement. Makers of stoves, small hardware and cotton mill equipment, who have been covering on fair lots in the pig iron market and builders who have been buying round bars in the steel market, are now inactive due to the uncertainty and the indications of price reduction. Business which usually expands rapidly at this time of the year now is falling off.

Yen—$0.48

Agents for the Indian furnaces have increased their importation of low priced pig iron. They have announced that they will soon offer Indian tin plate and shapes on the Tokio market. This has aroused the Japanese furnaces to competitive activity and Manchurian iron now is offered around 51 yen ($24.48) per ton.

The agents for Hugo Stinnes have also announced that rails, construction material, ship plates, wire ropes, steel alloys, boilers and engines, mining machines, pumps, and other products will be shipping into Japan in the very near future.

The price in the iron market is quite unstable and free shading is practiced. No. 1 Japanese is quoted at 67 yen ($32.24) per ton. No. 2 at 62 yen ($29.76) and No. 3 at 58 yen ($27.84). No. 1 Hanyang is quoted at 63 yen ($30.25) per ton, No. 3 Cleveland at 72 yen ($34.56) per ton. Indian iron is quoted at 55 yen ($26.40) to 58 yen ($27.84) per ton. Round bars are quoted at 4.60 yen ($2.20) per 10 kwamme, flat and square bars at 4.70 yen ($2.26) per 10 kwamme. Plates are quoted at 4.20 yen ($2.02) and sheets at 7 yen ($3.36). The kwamme is equal to 8.2673 pounds.

Look for Advance in German Prices

European Special Service

DUSSELDORF, Germany, Nov. 15.—The steady increase in pig iron prices, expressed in marks, is unchecked and it is now believed by iron and steel interests generally that several more advances must take place before the end of the year inasmuch as the internal price is still below world levels. Westphalian hematite has been increased by 11,249 marks ($1.55) to 95,243 marks ($13.40) a ton; No. 3 foundry, Oberhausen, to 79,272 marks ($11.05), with Luxembourg foundry 74,562 marks ($10.40).

Mark—$0.00013

Furnace coke has advanced to 11,873 marks ($1.66). Billets are now quoted at 24,500 marks ($17.40), with sheet bars 133,500 marks ($18.70). Finished steel has correspondingly advanced with bars, shapes and plates now ranging from 128,740 to 196,000 marks, equivalent to 0.82c to 1.24c per pound.

Price increases are following each other so tumultuously that all sense of regularity has disappeared from the market. Internal business is becoming highly speculative and the same may be said of foreign trade owing to the fact that costs are calculated on fluctuating exchange values. In some works now wages and salaries are being altered every few days, as the cost of living is rising almost daily and the workmen will not be satisfied with wage agreements covering any period of time. Railway rates are being advanced on an average once a month and the situation generally is unsatisfactory.

Imports of foreign ores and English coal and coke are somewhat lower owing to the difficulty of making payments in foreign exchange. The inland demand for German iron and steel is decreasing owing to the financial situation, but export business shows signs of improvement owing simply to the temporary exchange situation.

Foreign Products Find Market in Austria

European Special Service

Austrian Crown—$0.0000135

VIENNA, Austria, Nov. 15.—With Austrian works quoting on a stabilized monetary basis of gold crowns as previously reported, foreign producers are finding better opportunities for business. Quantities of both German and Czech iron and steel are now coming into the country. As a result the Alpine Montan Gesellschaft is making plans to restrict production for the first time in several years. Decreases in wages in Czecho-Slovakia have further tended to give Czech producers an advantage in the Austrian markets. Austrian works are finding it difficult to retain control of what they consider are their natural markets, and the steel works especially in Styria have been reduced to thin order books.

The Czech market price for bars is 1500 crowns ($47.55) per ton but sales are being made in Austria at 1000 crowns ($31.70) per ton and occasionally even at 950 crowns ($30.11). This is equivalent to a price delivered in Vienna of 1288 crowns ($40.84), in which market the Alpine Montan Gesellschaft is quoting 1616.30 crowns ($51.14). Rather drastic reductions in Austrian iron and steel prices are therefore expected.

In Czecho-Slovakia prices have again been reduced and in view of the high value of the Czech currency some exceedingly low quotations are being made. The latest reductions range from 400 crowns to 700 crowns ($12.68 to $22.69) per ton. This is the third price reduction within two months. The minimum prices, excluding the 3 per cent tax for bars and shapes are now 1550 crowns ($49.13) per metric ton with bands, 1950 crowns ($61.81); light rails 1550 crowns ($49.13); sheets over 5 millimeters 1800 crowns ($57.06); sheets under 3 millimeters 2100 crowns ($66.57); and galvanized sheets 3500 crowns ($110.95).

Railway freight rates have been reduced in the past few months by 30 to 40 per cent and the price of coal has also been considerably reduced. Furnace coke is now quoted at 347 crowns ($11). There are about 170,000 men unemployed in the Czech iron and steel industry to which should be added 270,000 men working on short time.

The leading Hungarian iron and steel works, the Rima Muranya Co., states that its production for the fiscal year ending June 30, 1922, was 94,500 tons of pig iron and 135,000 tons of steel. In the first half of 1922 Hungary imported 19,500 tons of pig iron, 6000 tons of semi-finished steel and 9000 tons finished. The exports include 6300 tons of finished steel.

The Russian Soviet government in connection with the German Wolff steel syndicate has established a German-Russian trading company with a nominal capital of £30,000 ($133,000). The syndicate however has credits available for transacting business amounting, it is stated, to £1,250,000 ($5,550,000). Bands are being quoted in Russia at 85,366 rubles and wire at 91,460 rubles per ton.

Scrap Weakness Prevails

(Concluded from Page 1462)

er scrap orders placed for shipment to consumers at Donora and Midland, Pa., has imparted a little further strength to the scrap market. From 5000 to 10,000 tons is said to be involved in the Donora orders while about 7500 or 8000 tons was purchased for Midland. It is understood that in one case up to $21 was paid for heavy melting steel while on a small portion of the other tonnage $21.50 had to be paid. The market, therefore, is considered quotable at $20.50 to $21 this week instead of $20 to $20.50, the prevailing spread one week ago. This strength in steel scrap is having an influence on the sheet grades, compressed and bundled sheets being 50 cents higher. Reflecting the weakness in the pig iron market, the position of the cast grades is strong, heavy breakable being 50 cents lower and No. 1 cupola being $1 a ton lower than last week. Not much industrial scrap is coming out and yard stocks are depleted, only one or two yards having stocks of any size to fall back upon. The railroad lists with one or two exceptions are small. The eastern region list of the Pennsylvania railroad on which bids will close Dec. 5 calls for 31,100 tons of assorted grades and 1396 tons of relaying rails. While this region's list is larger than a month ago, the central, northwestern and southwestern lists are relatively small.

Only Small Lots in Demand

Philadelphia, Nov. 28.—Scrap demand is lagging. Only small lots are involved in current demand. Consumers in numerous cases have requested a halt in deliveries, hence the market is weak and lower. As an exception to the general rule, one eastern mill has released considerable tonnage of steel scrap previously placed.

Small Tonnages Are Moving

Cleveland, Nov. 28.—Buying of iron and steel scrap is unimportant, movement being confined to small tonnages, consuming interest being almost negligible. However, contract material is not being held up, largely from the fact that deliveries have been considerably delayed as a result of car shortage. The market is holding up fairly well despite absence of new purchases.

Trading Continues Light

New York, Nov. 28.—Trading in iron and steel scrap continues light, with three grades off about 50 cents. No. 1 heavy melting steel is now quoted at $12.50 to $13, f.o.b. New York, No. 1 railroad steel, $13.25 to $13.75, and wrought pipe, $10.25 to $10.75. In this latter grade, buying is practically at a standstill. An encouraging feature, however, is an improved inquiry for cast scrap by pipe foundries, which are figuring on some considerable work likely to be placed within the next few days. Bethlehem continues to be practically the only important eastern buyer of heavy melting steel.

Prices Further Weaken

Boston, Nov. 28.—The declining pig iron market has been closely followed by a slump in the cast scrap market in Boston. Railroad malleable still holds fairly firm at $20, delivered, but stove plate is down to $16, and No. 1 machinery is hard to place at $20. Demand from Pennsylvania consuming points still exists for heavy melting steel, yet the price has dropped to about $13.50 shipping point. Blast furnace borings and turnings have dropped to $10.50, a drop of a full dollar within the last week. Nearly all other grades are off 50 cents, and buying is listless.

Sales of the New York Airbrake Co., totaled $932,000 for October compared with a monthly average of $567,695 for the first 10 months of 1922. October business was the largest, confined strictly to air brakes, in the company's history.

Credit Demands Are Relaxing

Exceptional Expansion in Autumn Trade Causes No Strain on Bank Resources—Car Shortage Diminishing—Foreign Exchange Rise Reflects Better Sentiment—October Exports Gain

BY JOHN W. HILL, FINANCIAL EDITOR

CREDIT requirements for an almost unprecedented autumn trade expansion, coupled with the greatest peacetime rise of prices ever recorded, have been met this year without the slightest suggestion of a strain upon banking resources. Commercial paper rates at New York have had a mild advance to 5 per cent. It is true also that both rediscounts and note circulation of the federal reserve system have advanced sharply since last summer. At the peak, however, the total of bills on hand of the federal reserve banks was 70 per cent below the 1920 high level, while notes outstanding were 31 per cent less.

At the same time the cash ratio of the federal reserve system, pictured in the Business Trend chart, remains at about 76 per cent, compared with 41 per cent in the fall of 1920. This is all of great significance because credit is the lubricant of trade and previous periods of business prosperity have never terminated until liquidation was compelled by acute credit stringency. If that same rule applies this time the experience of this autumn's business makes it clear that the present condition of credit will permit of further great trade expansion and even a substantial rise of prices.

Ordinarily the peak of fall credit needs comes about the middle of November. That was what happened this year. Last week the reserve ratio increased, while discounts and note circulation declined. Another evidence of contraction in activities is found in the decline in the daily average shortage of cars. The high point as revealed in the Business Trend chart, was touched in the last week of October. The reported shortages for the week ended Nov. 15 averaged 153,000 cars, or 26,000 cars less daily than two weeks before. The car shortage is likely to persist however, for some months.

Indications that the seasonal letdown this winter will be less general than normally, are found in the records of increasing iron and steel production and the plans for expansion announced by numerous automobile companies. Stock market uncertainty continues. Technical readjustment of over-speculation for the rise, rather than an unfavorable business forecast, is believed to be the cause. However the so-called radical successes at the recent election have affected investment sentiment.

One unfavorable factor in the outlook is Europe's poverty. Much has been made of this recently and bankruptcy for Germany, France and other countries was predicted. A more cheerful sentiment now prevails, however, and this is reflected in the rise of exchange rates for all countries save Germany. Moreover October exports of $372,000,000 set a new high record for the year; in fact they were the largest since March 1921. Manifestly Europe must continue to buy raw materials and food from this country. A way to finance these purchases will be found, notwithstanding the financial difficulties of European governments.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	436	431	357	452	356
Cash Ratio Fed. Res. System.	76.7	75.2	77.6	72.3	.....
Loan rate, 4-6 month, N. Y (per cent)..	4½-4¾	4½-4¾	4¾-4½	5-5¾	5¼-5¾
Aver. 20 Ind'l shares	$89.49	$90.12	$94.21	$74.02	$76.21
Aver. 20 Rail shares	$83.15	$85.86	$91.75	$74.99	$103.18
Aver. 40 bonds	$78.38	$78.65	$80.70	$76.23	$93.00
Car loadings (week ended Nov. 11)....	953,909	994,827	983,470	755,777	*927,586
Bank debits 165 cities (000 omitted)	$9,213,497	$9,255,239	$9,865,022	$8,483,887	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	Nov. 21 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.52	$4.49⅛	$4.44	$3.99¼
Francs	19.3c	7.05½c	7.18c	7.12½c	6.96c
Lira	19.3c	4.79½c	4.75c	4.11½c	4.07c
Marks	23.8c	0.01 1/16c	0.01 3/16c	0.02 1/16c	0.35½c

MONTHLY COMPARISON

	October	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$253,137,000	$271,493,000	$222,480,000	$71,450,000
Business failures:				
Number	1708	1566	1733	1336
Liabilities	$34,647,438	$36,909,157	$53,059,000	$22,723,000
Excess of exports	†$85,000,000	$31,000,000	$146,490,953	$54,406,000
Excess of gold imports	$3,274,561	$23,065,000	$39,530,367	*$630,716
Bureau of Labor Price Index....	154	153	142	100
Bradstreet's Price Index	144.4	135.3	121	100
Economist's British Price Index..	4264	4189	4588	2717
Cost of Living Index	157.1	155.6	163.7	100
New incorporations	$651,577,390	$664,000,000	$508,394,000	$172,301,000
Railroad net earnings	†$75,000,000	$58,000,000	$105,400,000	$59,900,000

†Estimated. *Monthly average export excess.

The Business Trend

November 30, 1922

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Winter recession from greatest autumn trade expansion ever known has begun; many signs that seasonal lull will be less pronounced than usual; outputs gaining in iron and steel and some other lines; automobile output to continue unusually high.

FREIGHT TRAFFIC—Further drop in car loadings indicates passing of peak in traffic; record still at high level for season; car shortage total receding.

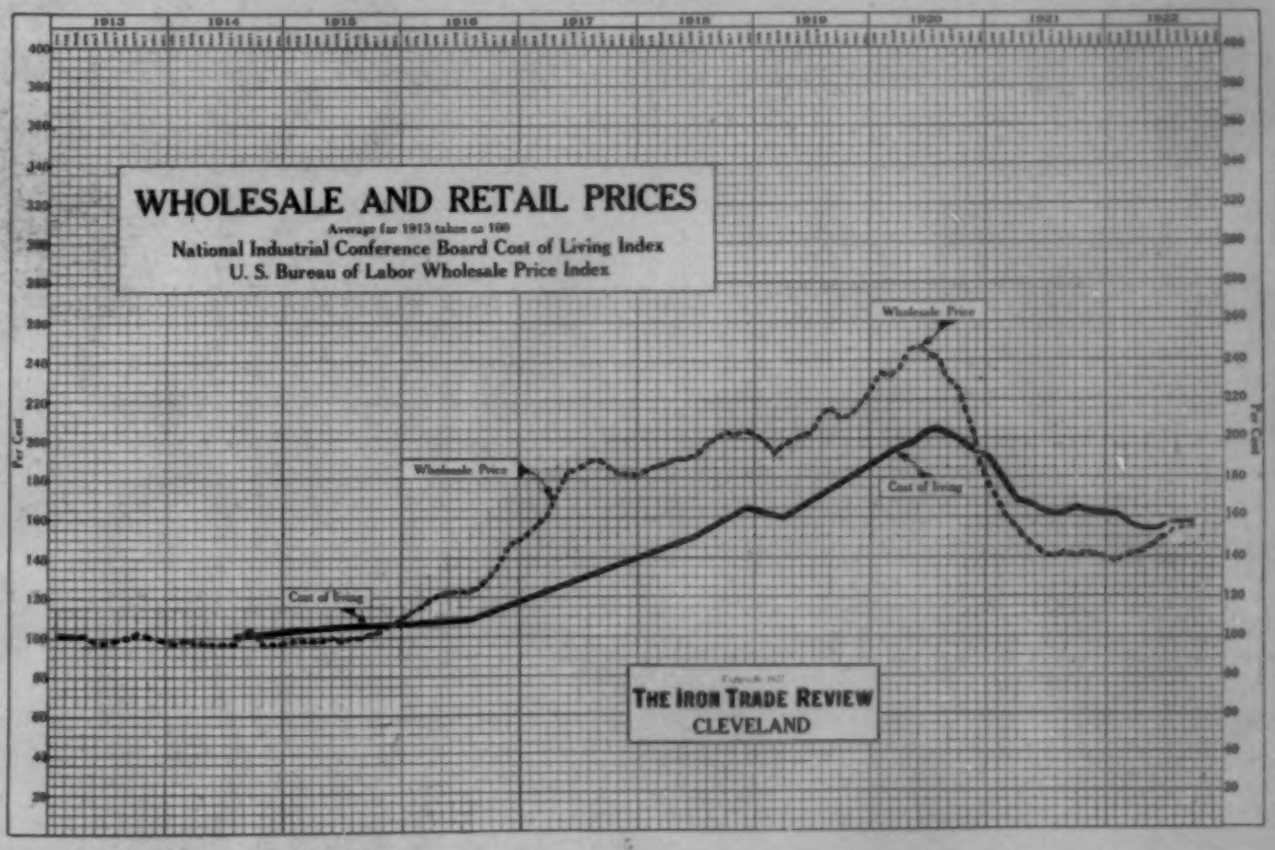
FOREIGN EXCHANGE—Sustained upturns in sterling, Italian lire and francs, feature foreign exchange markets; reflects improved sentiment for European outlook; marks still low.

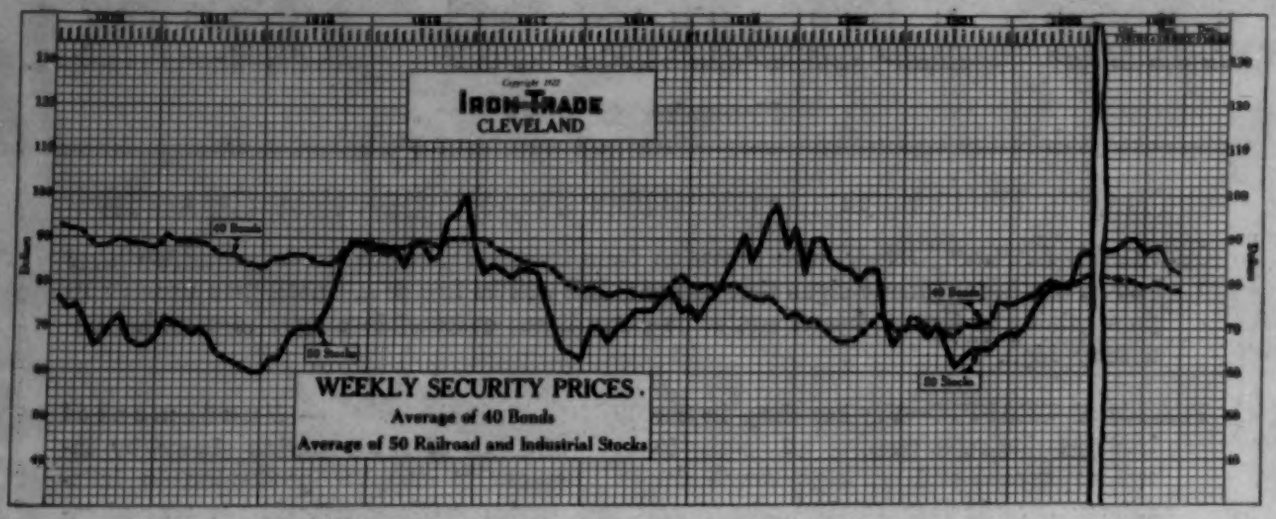
COST OF LIVING—After long period of decline or steadiness living costs turn definitely upward; still 10 per cent below one year ago; wholesale prices continue upward march.

SHEET SITUATION — Fundamental strength of sheet market shown by increase in October production in independent mills to near 92 per cent of capacity, highest on record.

BANK CLEARINGS—October check exchanges for country gained 13 per cent over September and 21 per cent over year ago; shows larger payrolls and growing trade activity.

INDUSTRIAL ACTIVITIES—October ingot and pig iron outputs 86.6 per cent and 77.1 per cent of estimated normal production; highest since 1920.

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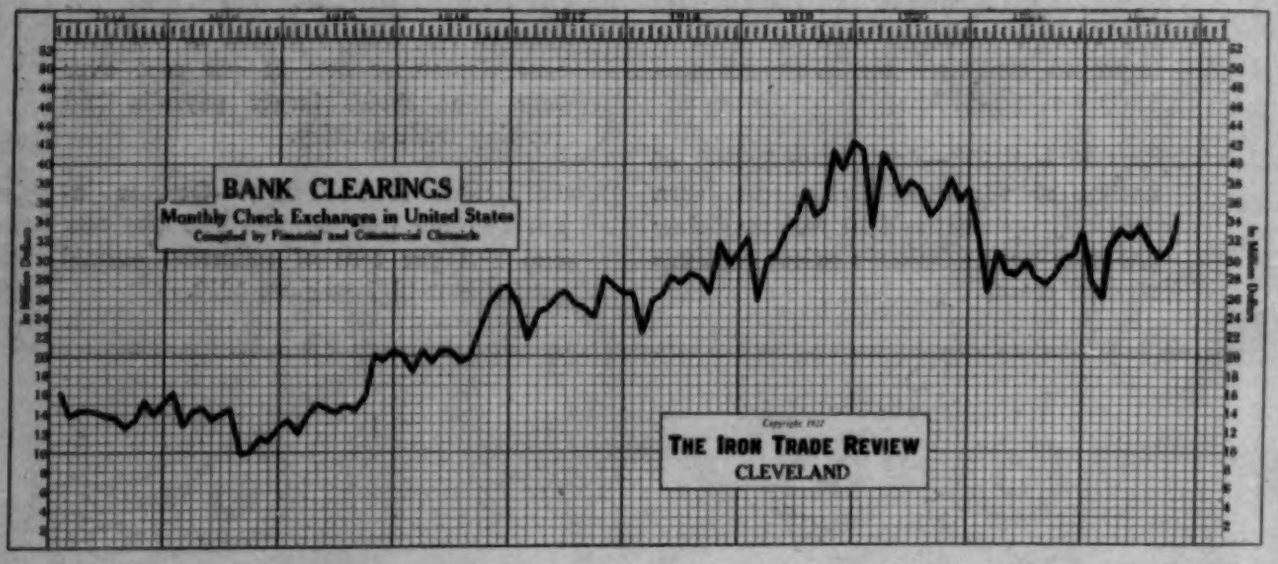
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES.
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks


BANK CLEARINGS
Monthly Check Exchanges in United States
Compiled by Financial and Commercial Chronicle
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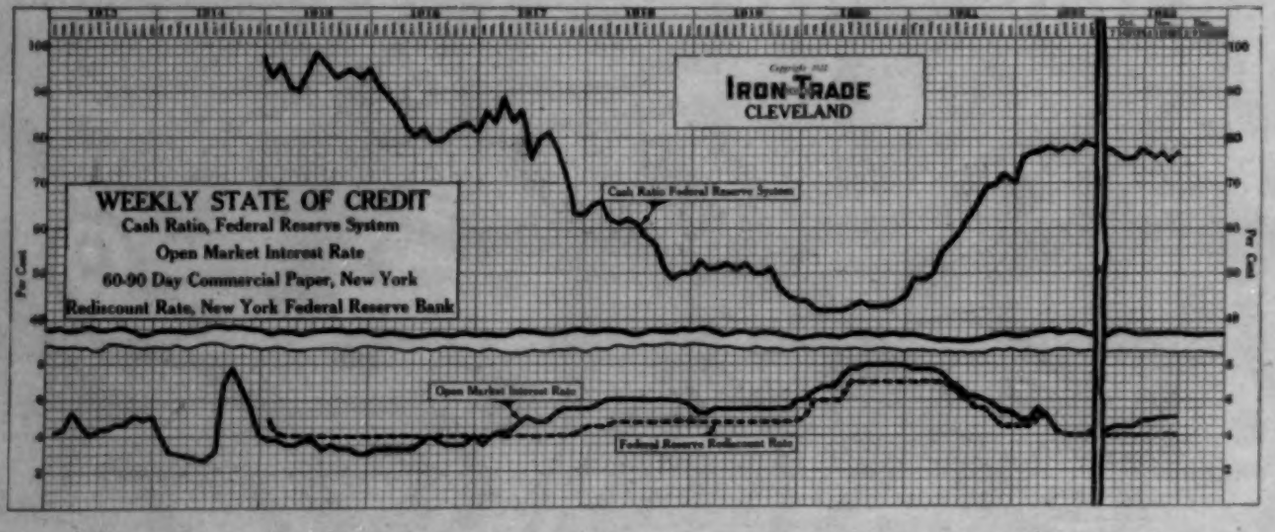
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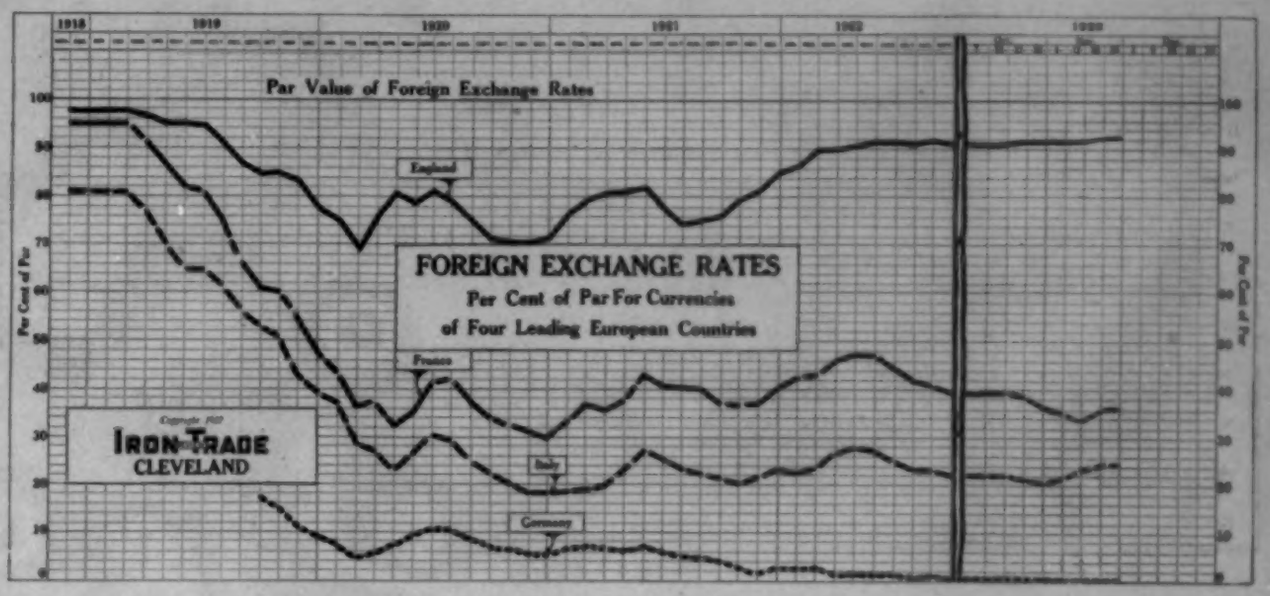
WEEKLY STATE OF CREDIT
Cash Ratio, Federal Reserve System
Open Market Interest Rate
60-90 Day Commercial Paper, New York
Rediscount Rate, New York Federal Reserve Bank
Cash Ratio Federal Reserve System
Open Market Interest Rate
Federal Reserve Rediscount Rate


Par Value of Foreign Exchange Rates
England
France
Italy
Germany
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies
of Four Leading European Countries
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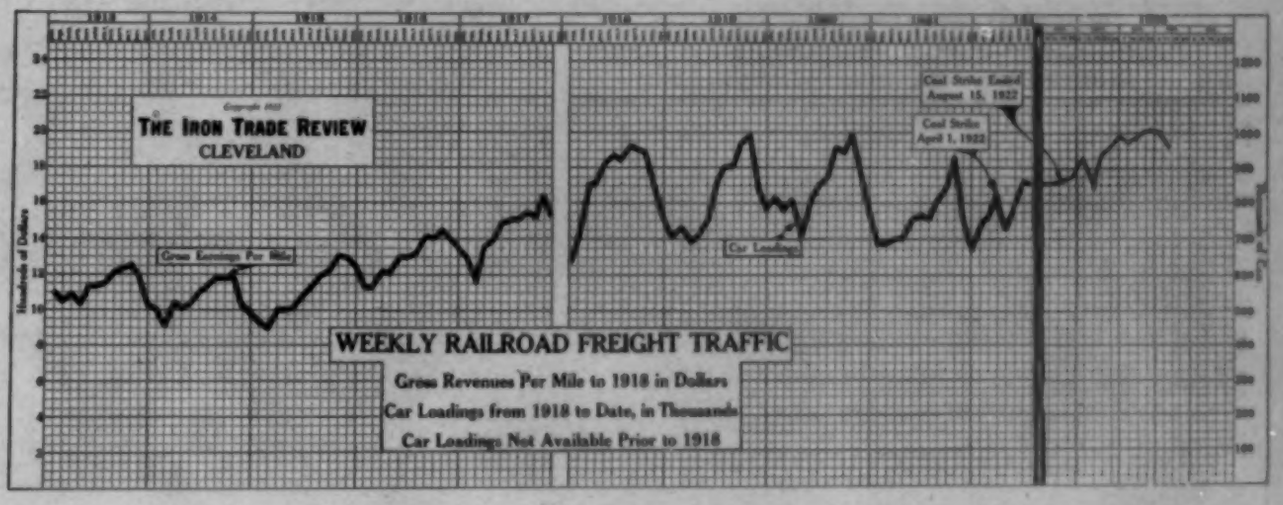
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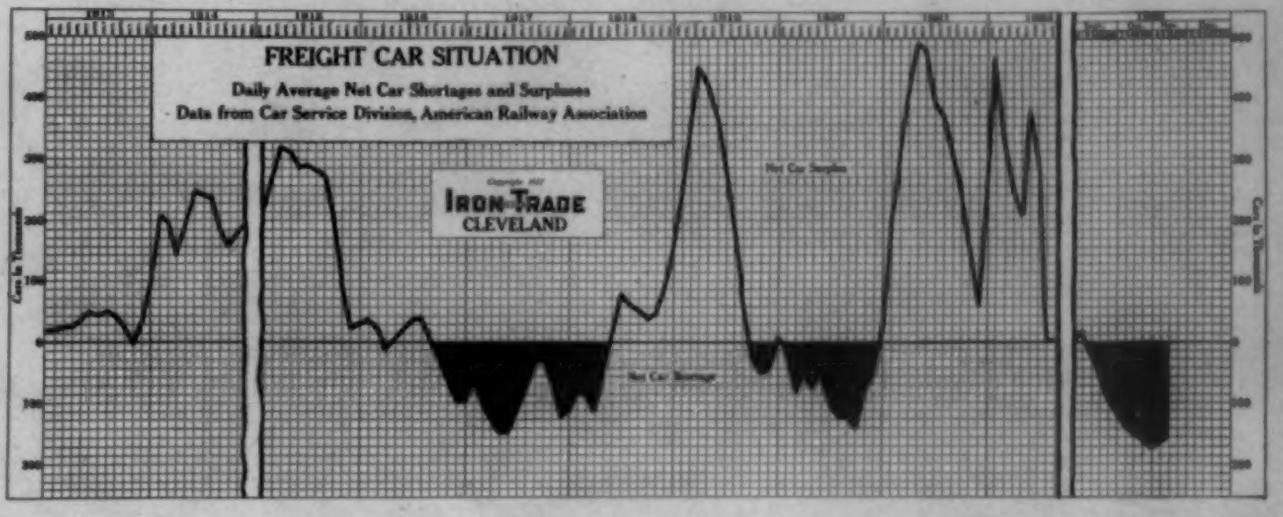
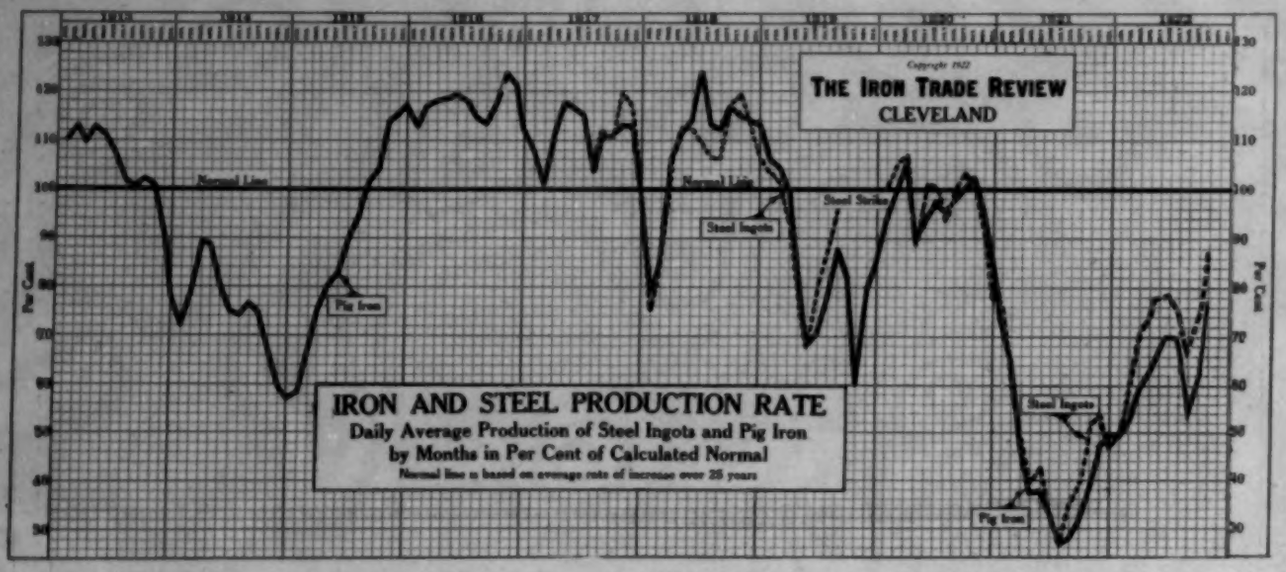
Gross Earnings Per Mile
Car Loadings
Coal Strike Ended August 15, 1922
Coal Strike April 1, 1922
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918


FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data from Car Service Division, American Railway Association
IRON TRADE
CLEVELAND
Net Car Surplus
Net Car Shortage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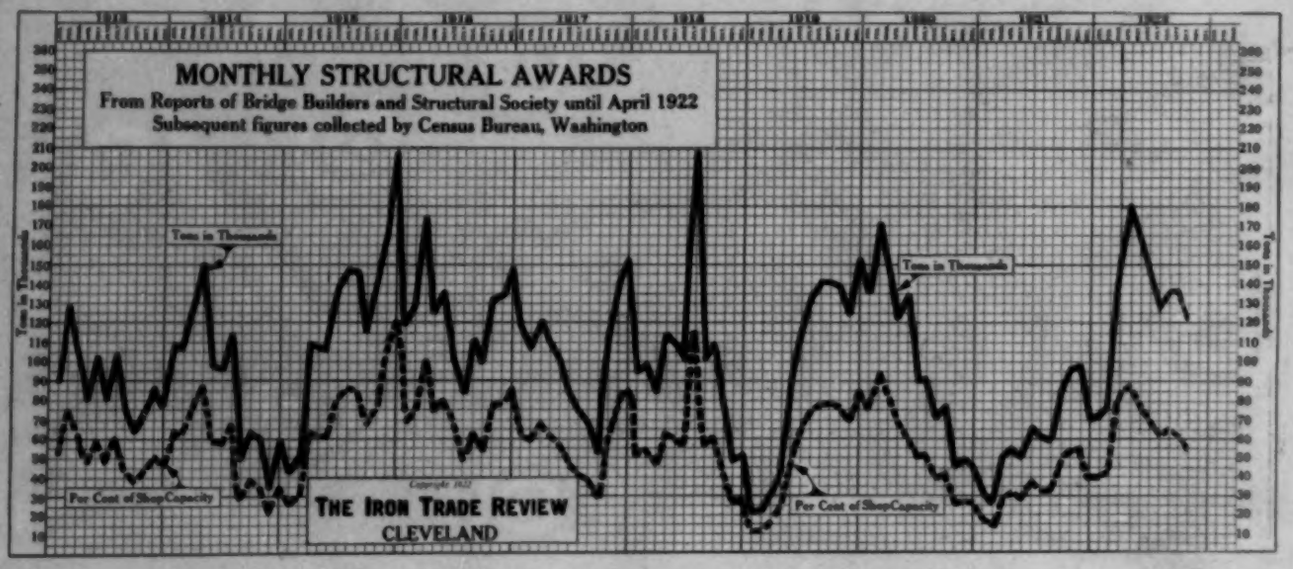
Normal Line
Pig Iron
Steel Ingots
Steel Strike
IRON AND STEEL PRODUCTION RATE
Daily Average Production of Steel Ingots and Pig Iron
by Months in Per Cent of Calculated Normal
Normal line is based on average rate of increase over 25 years
Per Cent


MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society until April 1922
Subsequent figures collected by Census Bureau, Washington
Tons in Thousands
Per Cent of Shop Capacity
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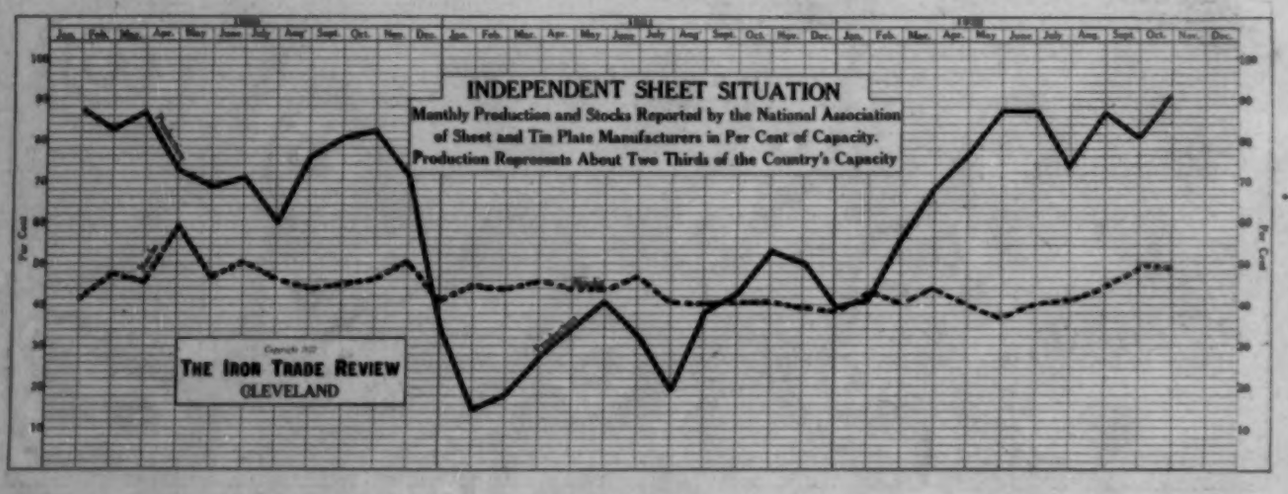
INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by the National Association
of Sheet and Tin Plate Manufacturers in Per Cent of Capacity.
Production Represents About Two Thirds of the Country's Capacity
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CLEVELAND
Per Cent

Producing Iron and Steel Tubes

Many Processes Used in Manufacture of Various Types of Welded and Seamless Tubes—Working Details Outlined Showing Range of Each Process and Diameters, Length and Thickness of Tubes Made

BY EWALD ROBER

TWO main groups are to be distinguished in iron and steel tubing, depending upon the method of manufacture, namely, tubes with a longitudinal seam, and tubes without a longitudinal seam, and commonly known as seamless tubing. For either group there are a number of different manufacturing methods employed. Even outwardly the manufacturing method may be traced by the appearance of the tube, this applying more especially to tubes with the longitudinal seam. The latter may be classified into welded, riveted, soldered and creased tubes but this article will deal with the two former groups only, namely, welded and seamless iron and steel tubes exclusive of drawn tubes.

Today welded tubes are made almost exclusively of weldable open-hearth steel, and no longer of puddled iron. The foremost manufacturing methods for welded tubes are the following:

I. Buttwelding by drawing through a die.
II. Lapwelding through rolls (patent welded tubes).
III. Hydrogen welding.
IV. Gas smelting-welding (autogenous).
V. Electric welding.

Seamless tubes are made of mild steel or wrought iron, principally according to the following manufacturing processes:

VI. Rolling mill (Mannesmann and Perrins process).
VII*a*. Punching and drawing press (Ehrhardt process).
VII*b*. Punching and drawing press for larger tubes.
VIII. Rolling mill and continuous mill.
IX*a*. Rolling process according to Stiefel and Swedish rolling mill.
IX*b*. Punching press and two-high rolling mill.
IX*c*. Punching press (Ehrhardt) and two-high mill.
IX*d*. Cross rolls and two-high mill.

Finally, for hollow bodies or tubes of large diameter and comparatively short lengths:

X. Punching press, drawing press and special (Ehrhardt) process.

The process of manufacturing buttwelded tubes by drawing through a die and lapwelded tubes by rolling, according to processes Nos. I and II are the oldest methods by which tubes have been made. The material used are scelps, or strips of sheet steel, corresponding in length, width and thickness to the length, circumference and thickness of the tubes. For seamless tubes, however, solid blocks of round or polygonal section are being used. The billets for the smaller seamless tubes are rolled, whereas for the larger ones they are cast steel ingots.

Manufacture of Welded Tubes

For making buttwelded tubes according to process No. I the ends of the scelp are first trimmed on the cold shears and bent slightly, so that the drawing tongs may get a proper grip. They are afterwards brought up to welding temperature in a coal or gas furnace. The hot scelp is now gripped with the tongs and pulled through a die in the shape of a funnel. It is thus buttwelded and formed into a tube. A short distance ahead of the die the seam is exposed to a current of compressed air, whereby the scale is removed at the joint and the latter is raised to welding heat, the joining of the material being thereby facilitated. In this manner tubes may be finished in one heat. After welding, the tubes are transported to so-called caliber-rolls where their correct diameter is obtained. Afterwards they pass through cross rolls for straightening, and finally are deposited upon a bed where they are allowed to cool. The final adjustments are then made prior to shipment.

For making lapwelded tubes, according to the process marked No. II, the edges of the heated scelp are first scarfed by being passed through special rolls. Formerly this was done on special edge planing machines. While in the same heat, the scelp is pulled through dies where it is bent into tubes. After having been thus prepared, the tubes are placed into heating furnaces where the temperature is raised to a welding heat. The actual welding is accomplished by the tubes being sent through welding rolls. Large tubes are not bent through a die, but through a bending machine. Sometimes the tubes can be welded in being passed through the welding machine only once, but often two or three heats are required for welding the tubes properly. In this case the tubes must be passed through the welding machine just as often. The welding machine consists of a pair of rollers with one pass, in which the tubes are rolled over a ball, resting on the point of a long pressure rod. After having been welded completely these tubes are also passed through calibrating rolls, through straightening rolls, and thence to the cooling bed and adjusting station.

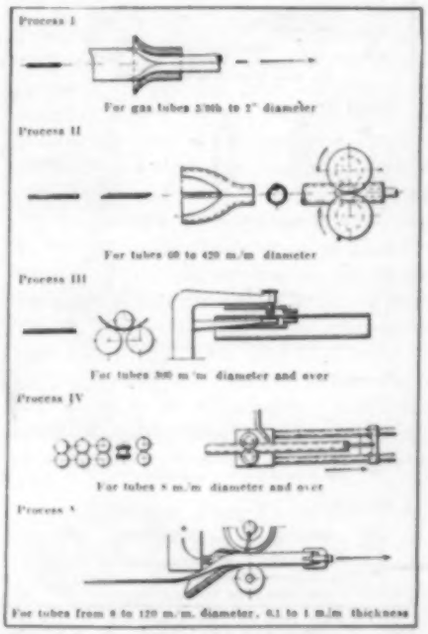
Process I
For gas tubes 3/8th to 2" diameter
Process II
For tubes 60 to 420 m./m. diameter
Process III
For tubes 300 m.'m. diameter and over
Process IV
For tubes 8 m./m. diameter and over
Process V
For tubes from 6 to 120 m. m. diameter, 0.1 to 1 m./m. thickness

FIG. 1—PROCESSES USED IN THE MANUFACTURE OF WELDED TUBES

In case of tubes welded by water gas according to process No. III, only the seam is raised to welding temperature rather than the entire tube as is the case with processes Nos. I and II. The edges are finished on an edge planer in order to be prepared for the weld and the scelps are bent into the shape of tubes in bending machines, either cold or hot. The joint is now heated in sections by means of a water gas burner, the heated part being welded together either on an anvil and by means of steam or pneumatic hammers, or welded together by hand. Sometimes hydraulic presses are used in place of the hammers. After this treatment the tubes are smooth and ready for use and are passed directly to the adjusting station. For gas smelting and electric welding it is again only the seam of the tube which is heated, heating being effected either by a mixture of acetylene gas and hydrogen or electrically by special processes.

Seamless tubes are manufactured from round billets, either by the Mannesmann or Perrins process, according to process No. VI. The billets are heated in a coal or gas furnace and rolled into hollow bodies; subsequently in the Perrins process they are rolled in the same heat into long tubes. Tubes over 300 millimeters diameter must be sent twice through the cross rolls, but in modern plants re-

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From a paper published by the Verein Deutscher Ingenieure, Berlin, in the November issue of *Engineering Progress*. The author is a civil engineer, Dusseldorf.

cently built, they can also be made in one heat. The correct diameter of the tubes thus produced is obtained on hot draw benches or in reducing rolls.

In the punching and drawing process, according to process No. VII*a*, solid blocks of square section are being used. These blocks are heated in a furnace and punched in a press in such a way that the hollow block retains a bottom. Afterward the block is pressed through a number of dies, one behind the other, in the same heat, thus being shaped into a tube. This is done on a long horizontal press, by introducing into the block a mandrel fastened to the press. Process No. VII*b* is essentially the same as No. VII*a*, the only difference being that the dies are not arranged the one behind the other. Whenever in the latter process the hollow block has passed through one die, the mandrel together with the block is pulled back. After a smaller die has been inserted, the block is pushed forward again and so forth. The cross-rolling mill and continuous mill, according to process No. VIII, requires round solid blocks, the same as process No. VI. These are punched in the cross rolls and shaped into tubes in the same heat, over a long mandrel in a rolling mill with about seven pairs of rolls located one behind the other, each set of rolls having only one pass.

Processes Nos. IX*a* to IX*d* employ different arrangements for the preliminary punching of the solid blocks. In all cases a two-high mill is used for finishing the tubes. The Stiefel process, No. IX*a*, and the cross-rolling arrangement, No. IX*d*, uses round blocks, whereas for the preliminary and final punching, according to process No. IX*b* and for the punching presses for process No. IX*c* the billets are made of square section. The Stiefel process resembles the Mannesmann process as shown under Nos. VI and IX*c* respectively. The hollow bodies made by this process are thinner than those produced by the Mannesmann process.

Tubes Are Planished

The round blocks are heated in a roller furnace, but the square blocks in a pusher furnace. On the preliminary punching press, process No. IX*b*, a mandrel is introduced into the block from both sides up to the center. After having been thus prepared, the block is punched through on another press with a thicker mandrel. On the punching press, according to process No. IX*c*, the square blocks are punched through with only one mandrel, in the same manner as with the press, according to processes Nos. VII*a* and VII*b*, but in this case there is no bottom left standing in the blocks. The hollow bodies made according to the four processes mentioned are passed through the two-high mill in the same heat. In processes Nos. IX*b* and IX*c*, the hollow bodies are sectionalized in several parts after passes through the rolls, heated in a heating furnace, and finished in the rolls.

The two-high mill consists of several housings, in which the hollow blocks are rolled into tubes over a plug. This plug is located in the roll pass between the two rolls, just as with the lapwelding process, and is held on the end of a rod arranged behind the rolls. The crown of these rolls is about 1.2 to 1.8 meters wide and contains a number of smooth passes side by side. Recently the tubes are being sent through planishing rolls after coming from the two-high mill, where they are smoothed on the inside and the thickness of the wall is equalized slightly. From the planishing rolls the tube is sent through calibrating rolls and thence to the cooling bed. After cooling they go to the adjusting station.

Process No. X is the well known Ehrhardt process for the manufacture of seamless hollow bodies of large diameter. The hollow bodies with bottoms are made on large punching presses similar to those

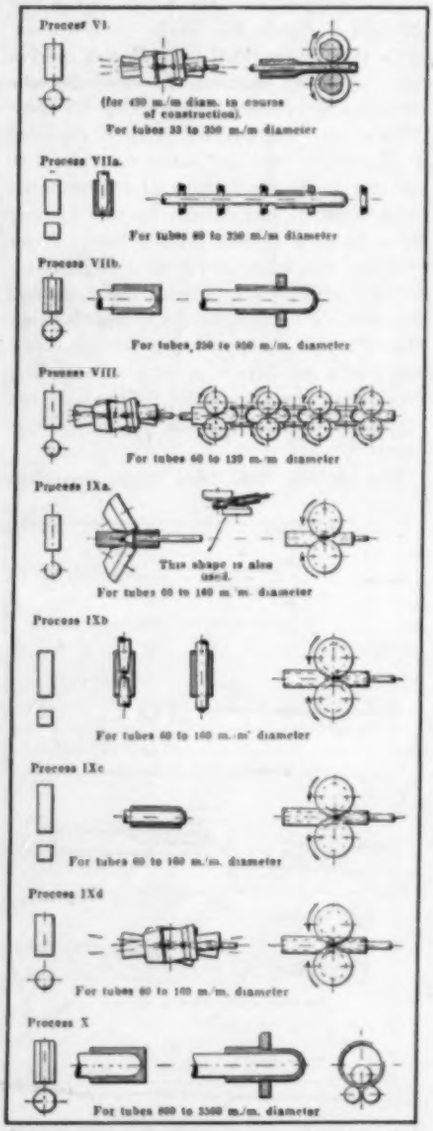
Process VI.
(for 450 m./m diam. in course of construction).
For tubes 33 to 350 m./m diameter
Process VIIa.
For tubes 60 to 230 m./m diameter
Process VIIb.
For tubes 250 to 900 m./m. diameter
Process VIII.
For tubes 60 to 130 m.m diameter
Process IXa.
This shape is also used.
For tubes 60 to 160 m.m. diameter
Process IXb
For tubes 60 to 160 m.m. diameter
Process IXc
For tubes 60 to 160 m./m. diameter
Process IXd
For tubes 60 to 160 m./m. diameter
Process X
For tubes 600 to 3360 m./m. diameter

FIG. 2—PROCESSES USED IN MAKING SEAMLESS TUBES

used in processes Nos. VII*a* and VII*b*, from blocks of square or polygonal section, and are drawn on a drawing press similar to that in process No. VII*b*. The bottom is now cut off and the wall of the hollow body is rolled out in a special rolling mill, in which working rolls are outside as well as inside the hollow body.

Obtaining Thickness and Length

In Figs. 1 and 2 the various processes for the manufacture of welded and seamless iron and steel tubes are represented diagramatically. Buttwelded tubes, according to process No. I, are made up to about 60 millimeters diameter—sometimes abroad up to 3 inches in diameter. The thickness of wall for gas piping is 2.5 to 4.25 millimeters and for steam piping 2.75 to 5 millimeters. Lapwelded tubes, according to process No. II, are not made below 60 millimeters outside diameter on the welding rolls. The working program comprises tubes of about 60 to 420 millimeters outside diameter. In various factories abroad tubes of still larger diameter are made, namely up to about 520 millimeters. The thickness of wall required for standard boiler tubes can be made without difficulty by this process; the walls may be made even thinner. The length of tubes is roughly 7.5 meters.

Hydrogen welded tubes, according to process No. III, are made with a minimum diameter of about 300 millimeters. According to this process, tubes up to the largest diameter may be made without difficulty. For economic reasons the minimum thickness of wall in these tubes is about 5 millimeters. The thickest walls used are 40 and even 90 millimeters. Up to 8 meters length the tubes are made without a round seam; beyond this length they are made with a round seam. Gas smelted and welded tubes, according to process No. IV, are made from about 8 meters in length and upward to the largest diameters. The thickness of wall is between 0.5 and 10 millimeters. Tubes from 8 to 120 millimeters diameter and about 8 meters long are welded automatically on special machines. For larger tubes, welding is effected by hand; there being no limit to the length of tube that can be made.

For the electric welding process, according to process No. V, the field of application is about the same as for the gas smelting and welding process, more particularly for tubes with a thickness of wall below 1 millimeter. In Germany, the electric welding process has not made much headway, but recently a number of processes have been evolved which are said to be competitive, especially for tubes below 1 millimeter in thickness.

In the Mannesmann and Perrins process No. VI tubes are rolled from 35 to 350 millimeters outside diameter, the minimum thickness of wall being that of

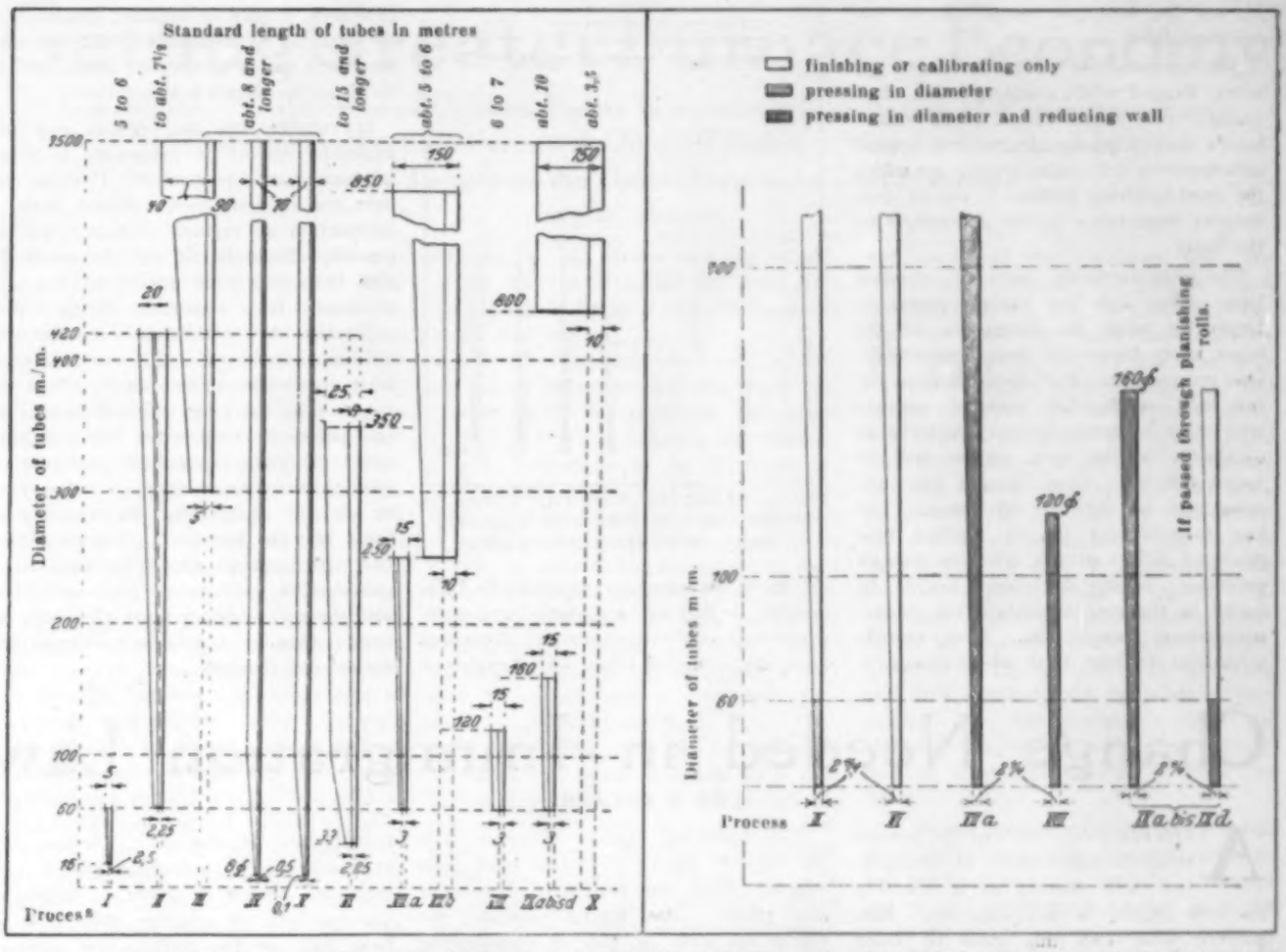

FIG. 3—(LEFT) LENGTH, DIAMETER AND THICKNESS OF TUBES FOR VARIOUS PROCESSES. FIG. 4—(RIGHT) DIAMETER AND THICKNESS OF WALL OF STANDARD BOILER TUBES FOR DIFFERENT PROCESSES

standard boiler tubes. Mills for tubes up to 420 millimeters are in course of construction. The tubes usually are made of double length of about 12 to 15 meters but even longer tubes may be made according to this process. Tubes made by the punching and drawing press process, No. VII*a*, have an outside diameter between 60 and 250 millimeters. Walls below 3 millimeters thickness are not made, the tubes being 5 to 6 meters long. The process No. VII*b* is a development of recent years, and by it the tubes have been produced up to 850 millimeters outside diameter and 5.5 meters long with a thickness of wall up to approximately 150 millimeters.

Other Processes Described

According to process No. VIII tubes are rolled from 60 to 120 millimeters diameter and according to processes Nos. IX*a*, *b*, *c*, *d* from about 60 to 160 millimeters. In this process the thickness of wall is not below 3 millimeters and not above 8 to 15 millimeters. With process No. VIII the length of the tube is roughly 7 meters and for the other processes about 10 meters. Large hollow bodies and large tubes of short length are made according to process No. X, the diameters ranging from 800 to 3500 millimeters and the maximum length being about 3.5 meters. The thickness of wall is between 10 and 150 millimeters. Fig. 3 illustrates the diameter, length and wall thickness obtainable with the various manufacturing processes.

Fig. 5 represents a schedule of the diameters and thickness of wall for gas tubes under the various processes of manufacture. Welded gas tubes, according to processes Nos. I, II and IV, the latter up to approximately 26 millimeters, are finished after welding as regards diameter and thickness of wall. Seamless gas tubes can be finished according to process No. VI for an outside diameter up to 33 millimeters. Below 33 millimeters the diameter must be reduced subsequently. Seamless gas tubes, according to the other processes Nos. VII*a*, VIII, IX*a* to *d*, must be reduced from 60 millimeters outside diameter down to 33 millimeters. For tubes below 33 millimeters diameter the thickness of wall likewise must be drawn down.

It will be seen from Fig. 4 that boiler tubes made according to process No. II, below 60 millimeters outside diameter, must be reduced. It will not be necessary in this case to draw down the thickness of wall. In case of seamless boiler tubes, according to process No. VI, diameters up to 32 millimeters may be obtained by finished rolling. In this case the tube need only be drawn once for calibrating. With the other processes, Nos. VII*a*, VIII, IX*a* to *d*, all boiler tubes must be equalized as regards thickness of wall. The latter must be reduced and all tubes below 60 millimeters must be drawn thinner.

Comparison Between Processes

In comparing the different processes for the manufacture of seamless tubes, it will be found that for tubes over 160 millimeters diameter and for lengths up to 6 meters, the Mannesmann and Perrins process, No. VI, and the processes Nos. VII*a* and *b*, the punching and drawing press process should be used. Tubes with smaller diameters than 60 millimeters or 33 millimeters, as also tubes with a thickness of wall below 3 and 2¼ millimeters must be made upon special reducing rolls, cold or hot draw benches, where the final dimensions are obtained. The Dowson gas welding process on the one hand, as also smelting and electric welding on the other, together with the pressing, draw-press, and rolling process have conquered a field of application somewhat different from the others. The buttwelded and lapwelded tubes, according to processes Nos. I and

II, are the foremost competitors of the seamless tubes.

The manufacture of boiler tubes, gas tubes, flanged tubes, coupling tubes, drill casings, coil tubes, spiral tubes, masts, booms, turbine piping, etc., requires special arrangements of manufacture, in which the manufacturing process is not of such decisive importance as the dimensions of the tubes.

The manufacturing costs of seamless tubes differ with the various processes. Depending upon the dimensions of the tubes, costs frequently change materially. One process places high demands upon the raw and semifinished material whereas with other processes ordinary material as obtainable in the open market will be found sufficient. Even Thomas iron may sometimes be used to advantage. The raw material per ton of finished tube produced differs greatly with the various processes; similar differences are to be found in the cost of installation, power, maintenance, wages, etc. Even experts sometimes disagree as to which process is

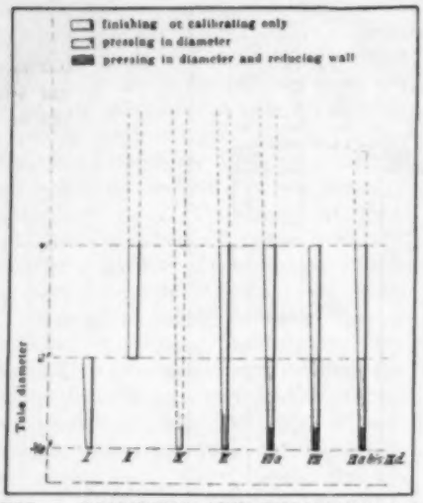

FIG. 5—DIAMETER AND THICKNESS OF STANDARD GAS PIPE FOR VARIOUS MANUFACTURING PROCESSES

the most advantageous economically. The trouble is that all processes have their advantages and shortcomings, depending upon the types of tubes and dimensions. However, it may be assumed that shortly the situation will become much clearer with the result that a number of processes will be discontinued in actual practice.

If reliable data as regards cost are available, it will be impossible to make mistakes in this connection. If these cost data are reduced to a common basis, a comparison as regards efficiency will be possible. Naturally it will be necessary also to consider the quality of the tube produced. It is important that a closer connection be established between tube mill and steelworks with the object, at least for larger tubes, not to allow the ingot supplied from the steelworks to cool before it is converted into a finished tube. As yet a number of problems regarding the manufacture of tubes must be cleared. Especially the finishing of tubes may be improved. The simplification of manufacturing programs is of considerable importance and, no doubt, also the tube industry must give more attention than heretofore to maximum efficiency and economy.

Change Needed in Immigration Law

BY J. M. LARKIN

A CONTINUATION of the present condition with respect to immigration will operate as a hardship on both employers and employes. Employers who need this class of labor will be unable to operate to full capacity, and further it may have a tendency to prevent the advancement to the higher skilled positions of those who at present are doing common labor. It is absolutely essential that there shall be an ample supply of labor coming to this country at all times to fill the positions of lower rank that are left vacant by those who have advanced.

The present 3 per cent law restricts immigration from all foreign countries except Canada, South America, and the West Indies. In 1921 there were about 14,000,000 foreign-born people in the United States. Since the law went in effect there has been quite an influx of immigration from Switzerland, Germany and Poland into South America.

Prior to the war the yearly immigration to the United States amounted to 1,250,000. In 1921 the quota of admissable aliens into this country was 357,000, but only 240,000 were actually admitted. The southern European races filled their quota but those from northern Europe did not take advantage of their quota, hence the difference between the number admissable and the number admitted.

Abstract of a paper read before the annual meeting of the National Personnel association, Pittsburgh, Nov. 8-10. The author is assistant to the president of the Bethlehem Steel Co.

The following figures illustrate how the various classes of labor have been affected since the restrictive law went into effect. The figures indicate the yearly net gain or loss of immigration over emigration prior to the war and for the year 1921.

Occupation	Yearly prior to war	1921
No occupation (Includes women, children, aged people, etc.)	+290,000	+76,000
Servants	+126,000	+50,000
Skilled workers	+118,000	+33,000
Professional	+ 9,400	+ 7,000
Farm laborers	+ 26,000	—10,500
Common laborers	+ 22,500	—68,000

(+) gain. (—) loss.

The five principal points of destination for immigrants in the past have been in their order: New York, Pennsylvania, California, Illinois and Massachusetts.

Prior to the war there was a yearly gain of about 125,000 immigrant Italians. In 1921 due to the excessive emigration and the operation of the restrictive law there was a net loss of 12,000. The figures for Poles for the same period were a gain of 84,000 yearly prior to the war and a net loss of 12,500 for 1921.

The losses sustained in farm and common labor are by far the most alarming to our present and future labor situation. Prior to the enactment of the law we experienced a yearly net gain of 50,000 to 75,000 industrial and farm laborers. In 1921, under the first year's operation of the law, we sustained a net loss of over 80,000.

While we recognize the present percentage law is unsound, I believe that in considering a substitute for it consideration should be given to improving the standards of selection over what we have had in the past. The situation would be greatly improved if applicants for entry to this country could be examined physically, mentally, etc., by our representatives in the foreign ports before emigrating.

Cement Output Increases

Production of portland cement in the United States in October totaled 12,287,000 barrels compared with 11,424,000 in September and 10,506,000 in October, 1921, the United States geological survey reports. Shipments were 12,854,000 barrels in October, 12,444,000 in September and 12,114,000 in October one year ago. Stocks at the end of October amounted to 4,157,000 barrels, against 4,724,000 at the end of September and 5,348,000 at the end of Ocotber, 1921. Imports of hydraulic cement in September amounted to 42,641 barrels and exports 78,615.

The effect of tempering a special hardened tool steel at 150 to 500 degrees Cent. upon its resistance to wear when worn against the same steel in the hardened condition, has been studied recently by the United States bureau of standards. Under the particular conditions of the test, the preliminary results indicate that the tempered steel shows less wear than the hardened steel.

Getting Greater Furnace Economy

Considerable Difference of Opinion Exists Concerning Installation of Recuperators on Metallurgical Heating Furnaces—Same Efficiency May Be Obtained by Increasing Length of the Unit—Discusses Test Methods

BY W. TRINKS

IN making the statement that natural gas and by-product gas are ideal fuels for heating furnaces, Mr. Chandler doubtless is correct. Looking into the future to a time when coal will be scarcer than now, we cannot help but feel that probably we will have to use a mixture of by-product gas with blast furnace gas. In many respects, that mixture will be superior to pure by-product gas, because it will allow the use of highly preheated air without the overheating of the combustion chamber.

In describing the practice of the Carnegie Steel Co. with regard to regenerative mill-type furnaces, Mr. Chandler states that only two furnaces are used per mill and that the furnaces are always kept at maximum temperature. The Carnegie Steel Co. may be able to do this because the mill in question rolls only soft carbon steel, but as a general practice that method is not to be recommended. Three furnaces should be used. With that arrangement, while one is being worked out or emptied another is being heated, and the third furnace is being charged and the heat started. If that is done, the billets or blooms, when first charged, lie in a comparatively cool furnace, because they pull the furnace temperature down. Mr. Chandler says, also, that billets are heated faster in regenerative furnaces than in continuous furnaces. The writer has seen blooms heated in continuous split-flame furnaces just as fast as they are heated on the hearth of a regenerative furnace. This statement does not imply the thought that fast heating is a desideratum. Quite the contrary, slow heating is better, particularly for high carbon steel.

The statement, "In the continuous furnace, with the rolling mill handling a given number of bars per hour, the length of the furnace fixes the time of heating." is apt to be misunderstood. It might be put the other way around and said: "The length of the furnace and the size of the billets fix the number of bars which the mill can handle per hour." In a number of mills the heating furnace limits the mill capacity. If continuous furnaces with end discharges are used, then we can say: "The length of each furnace, the size of the billets, and the number of the bars to be heated per hour fixes the number of furnaces which are required to do the job."

Although the paper does not exactly say so, it intimates that the batch-type furnace is to be preferred for billets from 5 x 5 inches up, and that the continuous furnace is to be preferred for smaller sizes of billets. The size of the billet or bloom is not the deciding factor. A mill in Pittsburgh heats 9 x 9-inch blooms in continuous furnaces. A mill near Philadelphia pushes 17 x 17-inch ingots over skids. A mill in central Pennsylvania pushes 22-inch ingots through continuous furnaces, and a mill near Pittsburgh uses a continuous furnace for 24-inch ingots.

To carry this criterion to the other extreme, skelp never is heated in a continuous furnace. This seems to indicate that we should heat in continuous furnaces everything that is of suitable shape and sufficiently regular in size and quantity for that purpose. Every steel plant has some sort of a mill which handles small and irregular orders. The billets vary in size, in shape, in length, in composition. Frequent shutdowns for roll changing occur. Evidently, that mill is no place for a continuous furnace. The outer skids would be bare half of the time; the rate of heating would not be right for both large and small sections; the recuperator would be burned out while the steel was being kept hot during roll changes, etc. It may be mentioned also that one of the principal reasons for the introduction of the continuous furnace was not fuel saving, but labor saving. That feature was strongly stressed in the patent law suits which followed the early days of the use of the continuous furnace.

Questions Test Methods

With regard to the test methods which were used by Mr. Chandler, it must be admitted frankly that they are absolutely standard in steel mill practice. But, being a college professor, the writer may be pardoned for finding fault with some of the items. One is the calibration of a gas meter by a pitot tube. In general, anybody who uses a pitot tube for calibrating another instrument is an optimist. It may be that in the three furnace tests described in the paper, there was in each case a long run of straight pipe absolutely free from eddies, or that a careful search was made of the velocities over the whole cross section of the pipe, in which case the results will be reliable; but for high class test work the following method is preferred: Break the pipe between the meter and the furnace, and put on the pipe end a well-rounded standard orifice; measure the total static plus the dynamic head by an impact tube for several rates of flow and more particularly for the rate of flow which the gas meter indicates in the regular run of the furnace. It is realized that the test engineer needs a special dispensation from the mill superintendent before he is allowed to break the gas main, whereas he can go ahead at any time and drill a hole in the line without permission, but that realization does not alter the fact that the method of calibration by a standard orifice is more reliable.

A second method used by Mr. Chandler is quite standard in steel mill practice, and yet its accuracy is doubtful. Measuring of the temperature of flue gases or of preheated air in regenerative furnaces by either a thermocouple in a protecting tube or by measurement of the temperature of the surrounding brick wall by an optical pyrometer is referred to. That neither of the two methods can indicate the true temperature becomes clear from the statement that neither a thermometer hanging in the sunlight nor a wall in the sunlight assumes the temperature of the surrounding air. That a thermocouple in a protecting tube shows too low a temperature when the flue gases pass out and too high a temperature when the air comes in, has been demonstrated.

Under the roof of a regenerator, next to the regular thermocouple, a fireclay filled with fireclay crumbs, was installed in the center of which a thermocouple was placed. A blower, protected by a screen and a long pipe line, sucked flue gas or hot air through the firebrick crumbs, which, on account of their large surface and small mass, assumed the correct temperature almost instantly. Differences of temperature between the regular pyrometer and the one imbedded in the fire brick crumbs amounting to more than 40 degrees were found. Of course, this method is available for test runs of 6 to 10 hours only. After that time the voids between the crumbs fill up with dust and slag particles, and it becomes impossible to suck the gases

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Discussion of the paper, "Heating Furnaces for Blooms, Slabs and Billets," presented by W. P. Chandler Jr. at the New York meeting of the American Iron and Steel institute, Oct. 27. This paper was published on page 1195 of the Nov. 2 issue of IRON TRADE REVIEW. The author of the discussion is professor of mechanical engineering, Carnegie Institute of Technology, Pittsburgh.

past the thermocouple. The customary method gives values which are quite suficient for supervision of the operation of furnaces, but they are misleading if true gas and air temperatures are desired.

Specific Heat Doubtful

Mr. Chandler uses the value of 0.166 for specific heat of steel within the range of the test temperatures. This value is somewhat doubtful, and it is unfortunate that no accurate values for the specific heat of steel exist. The bureau of standards plans to make such determinations in the future, but does not know when it will be able to undertake that task.

In looking over the test of the continuous recuperative furnaces, the writer failed to find a statement of the quantity of air delivered to the recuperator. That quantity is of interest, because it affords a means of checking the amount of leakage through and beyond the recuperator. Leakage there is, and the amount is by no means negligible. From data on a test which was made about nine years ago on one of the furnaces investigated by Mr. Chandler, the writer computed that 30 per cent of the air entering the recuperator leaked out before it reached the burners; and in another furnace in the Pittsburgh district which was equipped with a tile recuperator, 65 per cent of the air leaked out. An analysis of the spent gases just ahead of the recuperator would shed further light on the subject. With the aid of these data, a heat balance of the recuperator could be made and information gained on the problems of how much of the air leaks through the recuperator and how much leaks out afterward.

That much air leakage exists is well known to the engineers of the Duquesne Steel Works, for they placed cast iron ducts in the brickwork leading from the recuperator to the burners in one of their furnaces about 6 years ago. The low preheat of about 400 degrees Fahr. probably is due to leakage; a large weight of air, only part of which reaches the burners, is preheated to 400 degrees Fahr., whereas the correct weight of air might be preheated to 600 degrees Fahr. This is what the heat balance of the recuperator shows. The result of the heat balance is confirmed by tests on another furnace of practically the same dimensions. The fan was placed between the recuperator and the burners, sucking the air through the recuperator and leading it through an air-tight insulated duct outside of the furnace from the recuperator to the burners. A preheat of 600 degrees Fahr. was obtained easily. It may be remarked that sucking the air through the recuperator reduces leakage by equalizing the pressure on both sides of the partition walls. The stack pulls on the flue-gas side, and the fan pulls on the air side. An additional advantage of the elimination of leakage is the reduction of the pressure drop through the recuperator; for, if only 70 per cent of the air formerly hoisted passes through the recuperator, the pressure drop is only one-half of the former value.

When it comes to a comparison of thermal efficiencies between regenerative furnaces and continuous furnaces, it is quite evident that the two continuous furnaces tested by Mr. Chandler are more efficient at their particular rate of heating than is the regenerative furnace. But that need not be so in all cases, for in continuous furnaces the fuel consumption per unit weight of steel heated varies with the rate of driving.

As far as known a complete theory of the continuous furnace had never been developed. Since the writer needed such a theory for a book on industrial furnaces, he had heat transfer calculations made for continuous furnaces which resulted in a set of curves. The abscissae represent the path of travel of heated gases and of steel through the furnaces, while the ordinates are temperatures. Figures on the curves indicated the rate of heating in pounds of steel per square foot of hearth and per hour. In these calculations losses by radiation and convection were taken care of. From the data which were thus obtained another set of curves were plotted showing the heat required in the fuel per pound of steel heated as a function of the rate of heating, and, to another scale, the thermal efficiency of the furnace. The results of Mr. Chandler's tests were entered. The coincidence between theory and tests was particularly close since the theory assumed that the steel would be heated to 2200 degrees Fahr., whereas the steel temperatures in Mr. Chandler's tests were all below that value. Furthermore, the writer's figures did not consider a roof recuperator. The curves showed that the efficiency of a continuous furnace drops if we drive it too hard. If we heat much steel per square foot of hearth and per hour in a continuous furnace, its efficiency drops below that of a regenerative furnace.

Data Sometimes Misleading

Even if some of the test points were some distance away from the theoretical curve, that fact would militate against the test rather than against the theory. Test data can be misleading in furnaces, because a great deal of heat is stored up in the brickwork of the furnace. If the rate of heating is changed, the new condition of equilibrium is not reached until many hours later, the time depending upon the thickness of the brickwork. In view of the great possibilities for error, the coincidence may be considered remarkably good. This fact was more strongly illustrated a collection of furnace tests from various sources; as before, heat consumption being plotted against rate of heating.

In the planning of continuous furnaces for new mills, the perplexing question always is this: Recuperator, or no recuperator? It is easy to get the same efficiency in a nonrecuperative furnace which is obtained in a recuperative furnace simply by making it longer and insulating the additional part. Of course, added length may be objectionable. Some one said jokingly that in a continuous furnace, the difficulties increase with the cube of the length. In furnaces with end discharge the trouble due to added length is obviated easily by installing more furnaces. Many mill engineers for that reason, are opposed to recuperators. However, the latter has one advantage, namely that with preheated air quicker combustion is obtained, less excess air is needed, and the furnace loss by scaling is reduced.

Mill Controls Furnace Adjustment

One more point should be brought out, namely, the interaction between the furnace and the mill. If the mill always produces the same section, and if there is no mill trouble, the furnace can be adjusted properly and can be let alone. In that case a sustained high efficiency can be obtained. If, on the other hand, the section varies, or if there is much mill trouble, it is next to impossible to maintain high furnace efficiency. This is particularly true for continuous furnaces with side discharge, because one and the same furnace is then required to heat a widely varying weight of steel in until time. It should be designed for fast flow of gases and also for slow flow. If it is right for one, it is wrong for the other. As an example for this statement, might be mentioned that furnaces as described by Mr. Chandler are, at times, operated with holes in the back and in the roof for the purpose of allowing greater gas flow through the heating chamber.

For furnaces with variable rate of flow, a properly designed recuperator offers probably the best solution. The question is, should it be a tile recuperator or a metallic recuperator? For variable rates of heating a tile recuperator is exposed to the danger of cracking. For fast firing a metallic recuperator is objectionable to a certain extent, because it may burn out; but that danger can be eliminated by calorizing the metal and by providing a bleeder. Furthermore, replacement of the recuperator tubes in this type of furnace can be facilitated by making that arch of the roof, which lies over the recuperator, sectional and removable. This feature is a great help for other work also, such

as replacing worn out skids which span the recuperator entrance.

As before stated, a preheat of 600 degrees Fahr. can be obtained readily with the present design of recuperator, but 800 degrees Fahr. or even 1000 degrees Fahr. should be obtainable if the tubes are provided with fins like those of a motorcycle engine or air-cooled automobile engine cylinder. The heating surface could be much increased by this method. It is well known that the merchant mill at Gary has cast iron recuperators of the inverted U type and that a preheat of 1000 degrees Fahr. is obtained without any trouble, but the recuperators lie under the hearth and are rather inaccessible.

Economy Favors Mechanical Oil Burner

BY J. A. LAROCCA

THE open-hearth furnace described in Mr. Helm's paper and operating on two grades of fuel oil is a novel and interesting installation. It illustrates a growing and logical tendency towards the heavy and cheap fuel oils in industrial heating operations. It seems that in this installation the light oil lines with the objectionable dead-end feature could be dispensed with and the circulating system used for both oils instead of for the heavy oil only. This change in the installation would simplify it and reduce the first cost. To avoid leaving the lines full of heavy oil at the end of the heat, the light oil could be turned on a short time before the end of the operation.

A few remarks on some fuel oil applications not mentioned in Mr. Helm's paper might be of interest. The importance of low sulphur fuel oils in high temperature processes in the steel industry is well known. The same restriction as regards sulphur applies to the brass manufacturing industry. The sulphur content here is of considerable importance, especially in furnaces used for annealing or heat treating sheet brass and copper.

While fuel oil has been used for many years in industrial heating operations of many kinds, it was not until the discovery of the Mexican oil fields in the early part of this century that cheap fuel oils began to appear in the American market in considerable quantity. The great inherent advantages of oil as fuel and the low cost of Mexican fuel oil in recent years have caused it to displace coal in many boiler plants. Instances arose where large plants operating furnaces with light fuel oils of domestic origin were faced by the desirability of burning in their boiler plants the cheap Mexican fuel oil instead of coal. A change, however, meant the use of two oils, a heavy oil for the boilers and a light oil for the furnaces, with consequent complication and expense. In many cases the idea of firing the boilers with oil was abandoned on this account, although in some instances light oil was used both for boilers and furnaces. However, as our experience with heavy fuel oil increases, there is a growing tendency to use this grade in all operations where the nature of the work permits, so that the lighter oils gradually are being abandoned for many classes of work.

Plants exist today which have solved the problem of using one grade of fuel oil for all purposes. Two plants in the vicinity of New York use a cheap heavy oil both for boilers and furnaces. One of these plants manufactures steel products and operates annealing furnaces and heating furnaces for drop forges. The equipment installed meets the best standard practice for handling heavy fuel oil, and consists of storage tanks equipped with heating coils, auxiliary supply tank, strainers, pumps and air chambers, oil heaters, temperature recording devices, oil meters and steam atomizing burners of approved design. All pipe lines are laid in underground trenches with a steam line adjacent to keep the oil warm. The viscosity of the oil is reduced by preheating in the storage tanks to about 140 degrees Fahr. The oil for the boiler room is pumped from the auxiliary supply tank through the oil heaters and heated to 180 degrees Fahr. before it reaches the burners. The oil for the furnaces is pumped from the auxiliary tank directly to the burners without further heating, and is atomized by compressed air or steam. The air pressure is about 100 pounds and the steam pressure about 125 pounds.

Use Steam for Atomizing

In the annealing furnaces steam is the atomizing agent, the furnace stack drawing in the necessary additional air for combustion. In the forge heating furnaces compressed air is the atomizing agent. The air jet not only atomizes the oil but furnishes at the same time a large part of the air needed for combustion. The oil used in this plant is Mexican fuel oil of approximately 14 degrees Bé. gravity. The sulphur content may run as high as 4¼ per cent, yet it has been found that no noticeable detrimental effects are produced in the product.

The other plant is a large copper refining plant. The furnaces are fired with the same grade of oil used by the steel plant, and the same general plan outlined above is followed for handling the oil. Part of the fuel oil goes to the boiler plant and is preheated to 180 degrees Fahr. in two stages before reaching the burners, and the rest is preheated to about 150 degrees Fahr. and goes to the furnaces. Steam atomizing burners are used both on the boilers and on the furnaces. No detrimental effect on the copper appears to be produced by the sulphur in the oil, and while it is admitted by the management that a lower sulphur content would be more desirable, the greater economy of the grade now used more than offsets the undesirable sulphur feature.

These plants represent large installations, the consumption of oil averaging several million gallons a year. They have successfully avoided the use of two grades of oil and have reduced expenses and complication of equipment.

It would seem that many heating operations, which are now performed by burning the light and more expensive fuel oils, might be performed just as satisfactorily and more economically with the cheap high sulphur oils, using equipment properly designed for the purpose. The success attained by these two plants should induce other users to investigate the possibilities of cheap high sulphur oils.

The statement in Mr. Helm's paper regarding the application of the mechanical burner to metallurgical furnaces is timely. The oil burners now used for such furnaces invariably utilize either steam or air under pressure as the atomizing agent. The use of these agents involves considerable expense and special equipment. The elimination of this type of burner and the substitution for it of the mechanical type would be a considerable step forward in the economic application of fuel oil to industrial heating operation.

As is well known, in the mechanical type of burner oil preheated to

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Discussion of the paper, "Use of Liquid Fuel in Metallurgical Furnaces," presented by R. C. Helm at the New York meeting of the Iron and Steel institute, Oct. 27. This paper was published on page 1281 of the Nov. 9 issue of IRON TRADE REVIEW. The author of the discussion is combustion engineer, the Texas Co., New York.

a temperature of 200 to 250 degrees Fahr., is forced at high pressure through the burner orifice. Before it reaches the orifice, it passes tangentially into a central chamber where it attains a rapid whirling motion. On leaving the orifice a powerful centrifugal action is therefore set up which disrupts the oil stream into minute particles. The atomized oil is thrown away from the axis of the burner and distributes itself along a thin conical surface with the apex at the orifice and exposed on all sides to the air.

The principle involved is admirable for atomizing oil of any viscosity without the use of either steam or air. The conical shape of the flame makes it satisfactory for boiler practice and for some types of metallurgical furnaces.

In order to adapt the mechanical burner to furnaces such as the open-hearth furnace where comparatively long and broad flames are necessary, the shape and length of the flame produced by the mechanical burner must be altered. This might be accomplished by modifying the whirling motion, by combining jets, altering the jet velocity or by changing the shape of the orifice. The field is a new one for investigation and is limited only by the inventiveness of the experimenter.

In adapting the mechanical burner for metallurgical work provision should be made for protecting it against the high temperatures prevalent in certain processes. Not only should the burner be protected against the destructive action of heat but undue heating of the burner should be prevented, as carbonization of the oil would undoubtedly occur and would clog the small passages in the tip. Various methods for protecting oil burners against heat have been described by Mr. Helm. Some of these methods may also prove suitable for the mechanical burner.

The principle of preheating has been found of great assistance in oil burning. Hot oils atomize easily and burn more completely. Preheating also is of advantage when applied to the air for combustion. The principle of preheating air rarely is applied in boiler practice and only in some cases in metallurgical furnaces. Considering the vast amount of heat that is lost during heating operations, it would seem that the problem of reclaiming some of this waste heat by preheating the air for combustion, and so increasing the present low efficiency of heating furnaces, should not prove too difficult to solve. In conclusion it might be said that the adaptation of the mechanical burner to industrial heating processes and the broader use of the principle of preheating appear to be the next important steps in the economic application of oil burning.

Would Devise Standard Furnace Tests

BY S. S. BALL

FUEL wasted in the open-hearth plants of the country, due to lack of accurate knowledge of how great are the heat losses and where these occur, must total a tremendous amount. Compared with the fuel efficiency of the modern steam boiler plant, the fuel efficiency of the open-hearth plant is at about the stage as steam transmission was when pipes remained uncovered. In order to reach the same relative efficiency, the open-hearth plant must undergo the same careful and scientific study as the boiler plant. Facts and figures must be made available. The paper by G. R. McDermott and C. L. Kinney Jr., presented many of these facts and figures. From our own experience, we can add to and corroborate this data perhaps in some useful way.

Temperatures were taken on a producer gas furnace of 50 tons nominal capacity, tapping 75-ton heats, after 268 heats on the roof and 765 heats on the checkers. The furnace was being charged with all cold stock and was making shamefully slow time. The travel of the gas was from the producer house through 100 feet of underground sewer up into a pipe line which had branches leading to the gas valves at each end of the furnace.

The temperature drop from one end of the gas sewer to the other end was fifty degrees. The loss in temperature in the branches of the gas main leading to the valves, however, was more considerable. These branches were each about forty feet long and temperatures, taken where they were connected to the valves, showed that while the gas was traveling through one branch, the temperature in the other branch was dropping 400 to 600 degrees during a half-hour period. Upon reversal it required about 20 minutes for the temperature in the latter branch to build up to normal. In other words, there was an average loss of about 200 degrees in the sensible heat of the gas at this point in its travel, due to the design and the construction of the gas mains. The remedy is obvious; make the gas mains as short as possible and put heat insulation between the fire brick lining and the boiler plate.

Temperatures taken in the gas flues, simultaneously with temperatures of the gas entering the valve, showed a loss of 300 degrees in heat between these points. Since the same valve was used to handle the waste gases traveling from the furnace to the waste heat boilers, there was also a material loss of heat available for making steam. The valve in question was of a common type, which brings the gas in direct contact with a considerable water surface. Mechanically, this type of valve is good, but it has a low thermal efficiency.

The furnace was equipped with water-cooled ports. The temperature of the waste gases passing from the furnace showed 200 to 300 degrees lower in the gas uptake than at the same relative point in the adjoining air uptakes. This indicates that the water-cooled port was lowering by 200 to 300 degrees the temperature of the incoming gas as well as the outgoing waste gases.

The above are the main facts brought out as regards heat losses in the travel of the gas from producer to furnace, and are losses due mainly to design and construction.

Additional heat losses existed due to faulty regeneration. Temperatures were taken on five heats. Some points of note are: 1. The producers are being run excessively hot; 2. gases in the outgoing flues are leaving the regenerators at a high temperature proving that the checker work is not functioning properly; 3. the air temperature in the ingoing air uptake drops off rapidly, confirming the fact that the checker work is not storing sufficient volume of heat.

One conclusion to be drawn from the two latter points is that a run of 765 heats, on the air checkers at least, without renewal, undoubtedly is too long for efficient working.

The 100-ton furnace proposed by the authors of the paper has been devised on principles which we fully indorse, and would emphasize as desirable, namely, a minimum of water cooling in valves and ports; heat insulation in flues and gas mains; automatic control of the air supply so that the air is delivered in proportion to the fuel to be consumed; and a port construction to give quick and intimate mixture of the air and fuel. The use of these principles in open-hearth furnace construction will go a

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Discussion of the paper, "Thermal Efficiency of the Open-Hearth Furnace," presented by C. L. Kinney Jr. and G. R. McDermott at the New York meeting of the American Iron and Steel institute, Oct. 27. This paper was published on page 1274 of the Nov. 9 issue of IRON TRADE REVIEW. The author of the discussion is superintendent of open-hearth departments Nos. 1 and 3, Lehigh plant, Bethlehem Steel Co., Bethlehem, Pa.

long way toward reaching the goal of high thermal efficiency.

It is our observation that the attention of the open-hearth superintendent has been necessarily devoted largely to maintaining an uninterrupted operation and to securing a maximum tonnage output. Much effort has been spent in increasing the life of the furnace and decreasing refractory costs. That the improvement in furnace tonnage and refractory cost has been accompanied by ever increasing fuel economy is not to be overlooked; but there can be litle doubt that the maximum attainable fuel economy has not yet been reached.

Since the largest single item in open-hearth conversion cost is fuel, any advance in the art that neglects thermal efficiency is incomplete and unsatisfactory. To achieve the best thermal efficiency we believe it necessary that temperatures be taken on all furnaces at regular intervals and at fixed locations, so that the open-hearth superintendent will always have at hand data on the various conditions from a scientific thermal standpoint. This would be both interesting and profitable.

In order, however, that the information obtained be suitable for comparison with work of a similar nature, carried on throughout the steel industry, a standard method of obtaining and tabulating the data should be prescribed and we believe that given the standard method, observations would soon become general and their results, if made available, would be of great benefit to the industry.

Sulphur Found by Evolution Method

BY V. E. HILLMAN

THE evolution method for the determination of the sulphur content in iron and steel has its own particular sphere of usefulness even though it yields values which are a trifle lower than those obtained by the more tedious gravimetric procedure. However, there will be no occasion for dispute if the analyst will embody the caption, *Evolution Sulphur* in his report.

Plain carbon steels generally yield concordant results which are dependable for routine work. The products of the blast furnace and cupola give percentages which are reliable for guide purposes, although duplicate analyses do not always give values which are in close agreement. This may be due in a measure to segregation in the metal, or to causes which are beyond the immediate control of the analyst. In any event, the evolution method has found a permanent place in the laboratory inasmuch as it is indispensable in the routine analysis of iron and steel products.

The sulphur in ferrous metals exists either as manganese sulphide or as iron sulphide, generally as the former if the metal contains its proper allotment of manganese. The sample drillings are treated with hydrochloric acid and an evolution of hydrogen sulphide ensues:

$$MnS+2HCl=MnCl_2+H_2S$$

The gas is converted to a metallic sulphide by conducting it through a suitable absorbent:

$$H_2S+2NaOH=Na_2S+2H_2O$$

The sulphide is subsequently dissolved by the aid of hydrochloric acid which again releases the hydrogen sulphide in a suitable vehicle for titration. The hydrogen sulphide is titrated with a standard solution of iodine, in accordance with the following reaction:

$$H_2S+2I=2HI+S$$

In routine analysis, evolution sulphur determinations are operated in any convenient number, usually in multiples of two or three depending upon the size of the laboratory. The accompanying illustration shows a form of an equipment which is robust, compact and easy to manipulate.

Three grams of drillings are weighed, and introduced into a dry 300 cubic centimeter erlenmeyer flask. A tight fitting rubber stopper equipped with a thistle tube and an exit tube is inserted into the mouth of the flask. The generator is placed on the stove, coincident with the immersion of three-quarters of the delivery tube into 90 cubic centimeters of absorption solution. Seventy-five cubic centimeters of hydrochloric acid (2 parts of acid to 1 part of water) are poured into the receiving bulb of the thistle tube. The lower end of it should extend beneath the surface of the acid in the flask during the process of evolution. Occasionally, concentrated acid is used when the metal fails to respond effectively to an acid of lesser strength. However, the use of concentrated acid causes a copious froth to form in the generator thereby rendering it more difficult to determine when the solution of the sample is complete. When the acid comes in contact with the drillings, an evolution of hydrogen and hydrogen sulphide ensues. The hydrogen goes free while the hydrogen sulphide is entrapped by the absorbent. The acid vapors which pass through the delivery tube and come in contact with the ammoniacal absorbent give rise to ammonium chloride fumes. These are of no consequence, and should be disregarded.

Hydrogen Sulphide Expelled

After the first action of the acid has subsided, apply heat until the solution simmers. The steam which is generated expels the last trace of hydrogen sulphide from the evolution flask. Prolonged boiling of the solvent is to be avoided, as excess acid vapors destroy the alkalinity of the absorbent. Remove the apparatus from the hot plate, and wash off the small amount of absorption solution which adheres to the delivery tube. Pour the contents of the test tube into a tumbler, rinse once, and add a piece of litmus paper. If the solution gives an acid reaction, the analysis should be discarded and another determination started. To the alkaline solution in the titrating vessel, add a slight excess of hydrochloric acid (one part of acid to one part of water) and accompany this action by gentle stirring with a glass rod until the indicator turns red. Avoid an acid layer. However, careless agitation of the solution contributes to low results.

Titrate the acidified solution with standard iodine until a faint blue color is discernible. The solutions obtained from bessemer steel, cast iron, and malleable iron manifest an orange coloration prior to the appearance of the end point. Plain carbon steel determinations pass directly from the water white to the blue color.

Knowing the strength of the iodine solution and the number of cubic centimeters of iodine required to produce the end point, the calculation of the sulphur percentage in the unknown sample is determined by inserting the necessary values in the equation:

Per cent of sulphur in sample=

$$\frac{\text{cubic centimeters of iodine x factor}}{\text{Weight of steel sample}} \times 100$$

Soluble starch is used as an indicator to determine the end point. Some laboratories add the indicator to the solution just prior to titration. However, equally accurate results are obtained by mixing the starch solution with the absorbent at the time the latter is made.

To make the solution stir 12 grams of Lintner's soluble starch and 50 cubic centimeters of cold water into a smooth emulsion. Starch prepared accordingly to Lintner differs from the ordinary starch in that it is purified potato starch and specially treated, whereby it is rendered soluble and loses the property of gelatinizing. Add the starch paste to 1950 cubic centimeters of hot water and boil for a few minutes. The indicator

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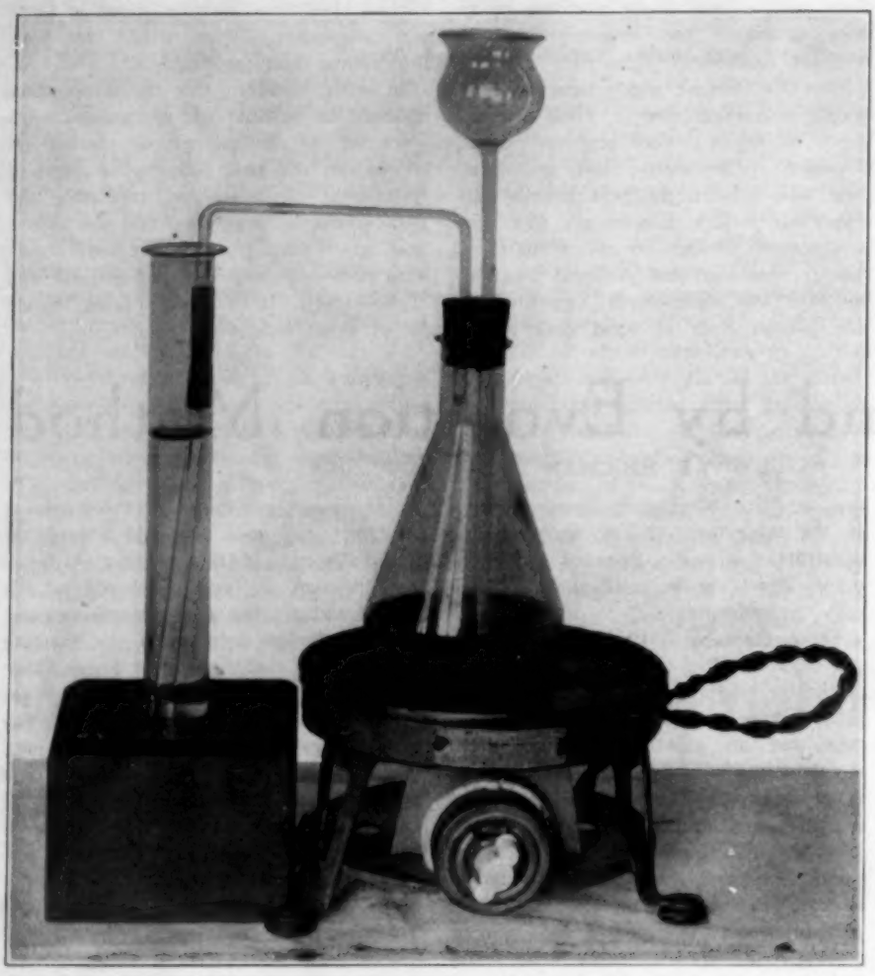

APPARATUS FOR DETERMINING SULPHUR BY THE EVOLUTION METHOD

should be free from flocks of insoluble starch.

Various absorbents are used for entrapping the liberated hydrogen sulphide. None of them possess any distinct advantage over the others save from the standpoint of cost and availability. The different absorbent formulae are given in the order in which they are used most extensively.

CAUSTIC ALKALI ABSORBENT

Caustic soda	200 grams
Strong ammonia	1000 c. c.
Water	13,000 c. c.
Starch indicator	2000 c. c.

ZINC SULPHATE ABSORBENT

Zinc sulphate	40 grams
Strong ammonia	2500 c. c.
Water	13,500 c. c.
Starch indicator	2000 c. c.

CADMIUM CHLORIDE ABSORBENT

Cadmium chloride	20 grams
Strong ammonia	2500 c. c.
Water	13,500 c. c.
Starch indicator	2000 c. c.

The absorbent and indicator should be compounded independently, and then mixed together.

To make the iodine solution dissolve 20 grams of potassium iodide in 50 cubic centimeters of water. Then add 9 grams of resublimed iodine. The presence of the potassium iodide facilitates the solution of the iodine crystals. When the reagents are completely dissolved, dilute the concentrated solution to two liters. Avoid the presence of iodine flakes in the solution prior to dilution.

An iodine solution should be stored in a dark, cool place. It is susceptible to deterioration even when kept under ideal conditions and consequently frequent standardization is advisable. The solution should be allowed to age several days before it is used for titrating purposes. An iodine solution standardized immediately after it is compounded, gives a radically different factor 24 hours later. In a properly prepared solution, the factor decreases only slightly from time to time.

Two general methods are in vogue for standardizing an iodine solution. One consists in obtaining a factor from a steel whose sulphur content has been accurately established by gravimetric methods, and the other by titrating against arsenious acid, and calculating the sulphur equivalent.

Standard steel samples containing known percentages of sulphur, can be purchased from the U. S. bureau of standards, Washington, D. C.

A known quantity of the standard sample is subjected to the operations incident to an evolution sulphur determination. The calculation of the iodine factor is dependent upon the weight of the sample, and the number of cubic centimeters of iodine used in making the test.

The principle of standardization by the arsenious acid method depends upon the conversion of arsenious to arsenic acid. This is accomplished by adding iodine to a solution of arsenious acid to which free alkali has been added.

$$AS_2O3+2I_2+2Na_2O=AS_2O_5+4NaI$$

Dissolve 0.03 gram of arsenious acid accurately weighed and approximately 0.5 gram of sodium carbonate in 50 cubic centimeters of water. Boiling promotes the solubility of the dendritic flakes which float on the surface of the liquid.

Cool the solution to the temperature of tap water and add 2 cubic centimeters of freshly prepared starch indicator. Moisten 0.1 gram of soluble starch with a few cubic centimeters of water. Dilute the paste to 20 cubic centimeters, boil, cool, and use as directed. If an attempt be made to titrate the hot solution the indicator is rendered inoperative.

Titrate with iodine until the solution is colored a faint blue, which indicates that all of the arsenious acid has been oxidized to arsenic acid.

Two molecules of sulphur are equivalent to one of arsenious acid.

$$\frac{2S}{AS_2O_3} = 0.3239$$

Therefore, the sulphur equivalent of one cubic centimeter of iodine is obtained by solving the following equation.

One c. c. of iodine=

$$\frac{\text{Weight of arsenious acid used}}{\text{Number of c. c. of iodine used}} \times 0.3239$$

Tests Alloy Steels

Endurance tests on bars taken both with and across the direction of rolling are being made in the study of molybdenum and cerium alloy steels at the Ithaca, N. Y., field office of the United States bureau of mines. The relationship between endurance and tensile strength which holds fairly closely for longitudinal bars does not hold nearly as well on transverse bars. The endurance of transverse bars is lower than that of longitudinal ones, and the amount by which they are lower appears to depend primarily on the type, size, number and distribution of the nonmetallic inclusions.

Training Steelworks Foremen-II

Managers and Superintendents Realize the Importance of the Subject—Instruction in the Fundamentals of Industrial Management Given in the Iron and Steel Industry with Successful Results—Club Idea Failed

BY B. M. NUSSBAUM

NO FIELD of industrial education has been the subject of so much thought and experiment during the last five years as that of foreman training. One effect of the emergency demands upon industry made during the World War was to emphasize the importance of the foreman's place in production. This caused many plant managers and superintendents to realize for the first time how completely dependent they are upon department heads for carrying out the plans and policies of the management. The result was that a great deal of attention was given to the problem of improving the average of foremanship. Numerous investigations and reports were made, and several methods of foreman training were devised and tried out in various lines of industry.

A method that has been used in the iron and steel industry with successful results starts with the basic proposition that primarily foremen need a training in the fundamentals of industrial management. This may seem, at first thought, the simple and obvious starting point for industrial education, but the fact remains that many plants have tried to found their foreman training on some other basis.

I recall a plant in the West which has an exceptionally alert and capable educational department. Most of the work of this department had been in the training of apprentices and beginners and in Americanizing foreign-speaking employes, but two years ago it decided that something should be done for the foremen. The department felt that it would be unwise to attempt putting the foremen through a regular course of study in the same way that beginners are trained. It was believed that foremen would resent a program calling for the use of textbooks, class meetings, and the usual educational features and that, in fact, the foremen were too old to be sent back to school.

Foremen's Club Organized

So the educational department decided to give the training informally by organizing the foremen into a club and developing in the club meetings discussion of the ideas that the management wanted to present. The foremen fell in with this plan almost unanimously, the club was organized, the men came out to meetings, but the management could not get the foremen to enter into any worthwhile discussion. Either they would sit around silent and indifferent, or they would indulge in trivial talk and personalities. Programs were arranged by the educational department, various executives were brought in to address the club. Topics would be assigned to the various foremen for discussion, but the discussion rarely amounted to anything. The club was fast degenerating into a focal point for the recitation of grievances—grievances that could better be handled in the privacy of the executive offices—when one day one of the foremen in a casual remark revealed the secret of the failure.

"Nothing To Talk About"

"The trouble with us in this club," he said to the educational director, "is that we don't have anything to talk about. You can't expect a workingman like me to make speeches on these things. All I know about is how to run my forge shop, and I'm no speaker."

The educational director understood instantly that the men needed a foundation of the basic knowledge of industry, of its organization, principles, and methods. The average foreman has only a sixth grade education, and it was not strange that he was unable to join in successfully with a conference group discussion, for that is what the club aimed to be. In this instance a course in production fundamentals was installed, as many of the foremen as could be interested were enrolled, and six months later the foremen's club was functioning in just the way that a successful foremen's club should function. The men were discussing their departmental problems in an intelligent and open-minded way, and when the management brought plant problems, new policies or suggestions, before the meeting they were not listened to in blank silence, but got an expression from the foremen in the form of intelligent questions, helpful suggestions, discussion, and always an attitude of understanding and co-operation.

The difference lies in the fact that the foremen had been conducted through a training in industrial fundamentals handled from the special angle of the former's needs and limitations. The training was not aimed to increase the individual's knowledge of his own specialty. It was not, for example, a training in the technique of the forge shop for the foreman of that department; or in the technique of foundry work for the foreman of the foundry. The whole object of the program aimed to broaden the foreman instead of to narrow him by further specialization. And so the training dealt with such subjects as self-analysis, job-analysis, handling men, handling machinery, the use of records, organization, and management policies.

While the training was anything but a specialization, the effect of it was to increase the efficiency of each foreman in his department. He was a better department head because he was a more intelligent member of the plant organization. He could co-operate with the other departments better, and with the management as a whole, because he understood the work of these other departments and knew the organization and plan of the production plant as a unit. He could handle his help better because he had been taught the principles of managing men.

How was this program put across? By the use of textbooks, lectures, problem work, and group conferences.

The textbooks were specially planned and written from the foreman's angle and in a style both simple and concrete so as to hold the interest of the reader and at the same time convey information of practical value. Experience has shown that standard school texts on industrial subjects are practically useless in foremen training, except for advanced courses with foremen who are already habituated to study. The foundation of the whole program was this specially prepared text material.

Teacher Needed

The lectures were given by men specially chosen and trained for this work. In a few rare instances it has been possible to utilize some execu-

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tive in the plant as a lecturer, but in most cases it was necessary to bring in men specially qualified and trained. A necessary qualification was that the lecturer have a practical knowledge of industry, but equally important was the possession of a teaching personality.

In order to test the foreman's knowledge of the subject matter assigned for study and also to give practise in using the principles and methods taught, problems dealing with various difficulties and situations in industry were given. The solving of these problems proved to be one of the most interesting and stimulating features of the training to most of the foremen. They accepted it as a stunt to be performed, and in many cases there was great rivalry and enthusiasm in comparing the results.

The final feature of the training was the group conference. Usually a conference followed a lecture, but in many cases additional conferences were held in the periods between lectures. The conferences were occupied with questions on the subject matter of the texts and lectures, and with discussion of these and other points brought up in the problem work. Usually there was no dearth of discussion, no awkward pauses; the men were full of questions and suggestions stimulated by their reading, and were only too eager to talk about these new and interesting ideas. Moreover, the program was followed through the three months' course to completion by 81 per cent of the men enrolled. This is a truly remarkable record, when you consider the difficulty of getting grown up men to submit to the discipline of an educational program under any circumstances.

However, 81 per cent is by no means the high-water mark of attainment, as is shown by the records of the following companies in the iron and steel and allied industries which have followed this same plan of foremen training:

	Number men enrolled	Number men who finished	Percentage finished
Carpenter Steel Co., Reading, Pa.	69	63	91
Detroit Steel Castings Co., Detroit	28	25	90
Dodge Steel Pulley Co., Oneida, N. Y.	33	33	100
Cambria Steel Co., Cambria, Pa.	61	56	92
Taylor Wharton Iron & Steel Co., High Bridge, N. J.	50	46	92
Union Twist Drill Co., Athol, Mass.	69	54	78
Bullard Machine Tool Co., Bridgeport, Conn.	43	33	77
Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.	68	61	90
Bagley & Sewall Co., Watertown, N. Y.	41	34	83

Following this basic training in industrial fundamentals, several plants have found it possible to continue the improvement of their foremen through advanced courses, through informal round table meetings or through the work of foremen's clubs. In many cases some form of continuation work is requested by the foremen, and invariably the continuation work has been successful. Through the primary training the foremen have become habituated to study, accustomed to weigh the advantages of proposed methods and practices in the application of principles to their own production problems. They are ready for more advanced and specialized training, and in most cases take to it gratefully and enthusiastically.

But most important of all, perhaps, is the changed attitude of the foremen toward the management and toward their own responsibilities. Every manager and superintendent knows the troubles of working against the hidden current of a foreman's indifference or opposition to a proposed improvement. It is an experience that happens occasionally in even the best plants, and quite often in the ordinary ones. In most cases the foreman's trouble is just ignorance.

The average foreman has never been awakened to the importance of his position as a key man in the organization of the plant. He is narrowed into the rut of his own department, and with his limited knowledge cannot see beyond his job. Hence his suspicion of efficiency schemes, progressive policies, and anything that means a change.

"Most workmen see the factory through the size of their pay check," said a Detroit foreman to a lecturer. "They know nothing about its organization or makeup or the problems which the big boss is up against all the time to keep going. The training in our class has given me an entirely new view of the manufacturing business."

Many foremen have gratefully acknowledged to the management of their plants the personal benefits received through the training. It is really affecting to see some of the letters they have written. Far from resenting the idea of going back to school, they have taken the pains to set down in writing their thanks to the management for affording them the opportunity to develop themselves.

Not only in grateful words but in deeds are the results of foremen training written. Lowered turnover of labor, better teamwork in the departments and between departments, closer co-operation with the management, reduced spoilage, increased output—these are some of the results that have been noted in numerous instances in plants where the foremen have been trained in industrial fundamentals.

Financial Statement Gages Management

BY F. O. HOAGLAND

IN attempting to gage a plant's standard of management one of the best schemes is to examine the company's bankbook, for this will not give credit for anything which is not in the bank. The financial situation as expressed by the bankbook, however, may not always show the true condition. Other factors, including perfectly sound investments, may enter into the proposition. In order to limit somewhat the scope of this paper, management only as applied to a manufacturing concern will be considered.

Whether a plant is a one man concern or a large organization, the management may be grouped under four main divisions as follows: 1. Productive; 2. Distributive; 3. Financial; and 4. Executive. These four divisions seem to form the standards whereby the management may be measured, and it is well, therefore, to give some attention to each item individually.

Under the heading of productive standards come engineering, purchasing, production, inspection and plant operation. The first considerations under the productive standard may be shown by the following questions: Do you plan your work? Is your engineering division arranged so that you can take care of all regular and special work simultaneously without having one interfere with the other? Does your plant division look after buildings, power, heat, light and general services? Does your purchasing department co-operate with the planning and production departments so that materials may be bought in quantities which strike a balance between those best suited for plant operation and those best designed to take advantage of a favorable market price?

One of the most important items to be

From a paper presented before a recent meeting of the Worcester, Mass., section of the American Society of Mechanical Engineers. The author is general manager of Reed-Prentice Co., Worcester, Mass., and works manager of Pratt & Whitney Co., Hartford, Conn., and Remington Arms Co., Bridgeport, Conn., all of Worcester, Mass.

purchased is labor, and under this heading means must be considered for perpetuating the required standard. Are schools maintained where new employes can be broken into the work? Is there an apprentice system? Under production it is important to have the necessary parts on the assembly floor when required. Is your organization of leaders arranged so as to provide for a proper flow of work fom one depatment to another? Are proper arrangements made to see to it that the product is being inspected as it passes through the different departments, or is it left ot the judgment of each individual foreman as to whether the product is good enough?

Turnover in a plant, both of the stock and the labor, forms an important gage for measuring management, and here must be considered the distributive and executive standards. Salesmen should believe in the product they are selling. They should be able to look a customer in the eye and tell him that the price they are asking actually represents the value of the article they are trying to sell. The production turnover in proportion to manufacturing facilities should be high, and should be watched carefully. An important question here is: Can the requirements for say six months ahead be estimated so that supplies of raw material, finished parts, or completed products may be kept at the most advantageous levels?

The executive standard has to deal directly with the policies of the concern. Carnegie once asked a plant manager "Do you have men around you who know more than you do?" It is important to have confidence in men with whom you are associated. You must be willing to trust them and keep them responsible for the work placed in their hands. Two important questions here are: Is there harmony within the organization and are understudies being developed in the important positions? An excessive labor turnover means that something is wrong, and the questions suggested by this feature are: Are opportunities for advancement offered young people? Are employes driven instead of led? Is security offered for old employes? Has there been many strikes? Do you follow the dictates of labor organizations? Are you in close contact with employes so that difficulties can be settled early before they reach a serious stage? Have you confidence in the product you are marketing? Is it something worth while for mankind? These questions, if frankly answered, serve to bring home to the plant manager the standards under which he is working.

Unless finances are so arranged that current obligations can be met comfortably the management has fallen below the financial standard. Financial statements should show the actual conditions. Financial reports should be submitted promptly and in a form which can be analyzed readily. Such reports, too often are obscure, and instead of being studied are filed merely for future reference, which frequently means filed for the use of the undertaker. The different divisions enumerated, namely, engineering, purchasing, production, plant operation, inspection, accounting, and distribution make up the factory organization, or if you like, the management of the business, but the performance of the whole group is reflected in the balance sheet. This sheet, if it is made out properly will show, whether or not the factory cost, consisting of labor, overhead, and material, has the proper relation to the selling price and the profit. In addition to this, it will show whether or not the inventories carried in stock are so great that they represent the major portion of the working capital, which may be the profit or savings of years.

Any large stocks of raw materials, parts in process, and finished parts, carried for any length of time are dangerous, as designs may change and prices may have to be written down on account of market fluctuations.

In brief, managing is the art of being able to have somebody else carry out your instructions in order to give you an opportunity to cover a larger field than otherwise would be possible. A manager who does something himself, which someone else could do better and at less expense is not living up to the proper executive standard.

Builds New Type Malleable Furnaces

BY HERBERT R. SIMONDS

DESIGNS for malleable iron furnaces of the reverberatory type have been the subject of so much study and experimenting during the last 15 or 20 years that it might seem that modern practice today would follow along approved standard lines. In general this is true, yet nearly every new furnace which is built embodies certain distinctive features which are the result of experience at various plants.

Two 18-ton furnaces recently have been built at the plant of the Arcade Malleable Iron Co., Worcester, Mass., after the design of John Jordan, the plant superintendent, a man who has devoted his life to the malleable iron industry. The operating results of both of these furnaces have been so satisfactory that a description of their detailed construction becomes of general interest. Fig. 1 shows a section elevation of the furnace. The chief feature of the design is the curve of the roof throw and also of the arch which are said to be constructed in such a way that the hot gases from the fire box are swept down along the surface of the metal to produce efficient melting without the use of an air blast. The side walls of the furnace are supported by a series of plates, each about 7 feet long, and construction is such that any plate may be removed readily without disturbing the others. The roof construction is shown in Fig. 3. Each bung is 7 feet long, carries one row of fire

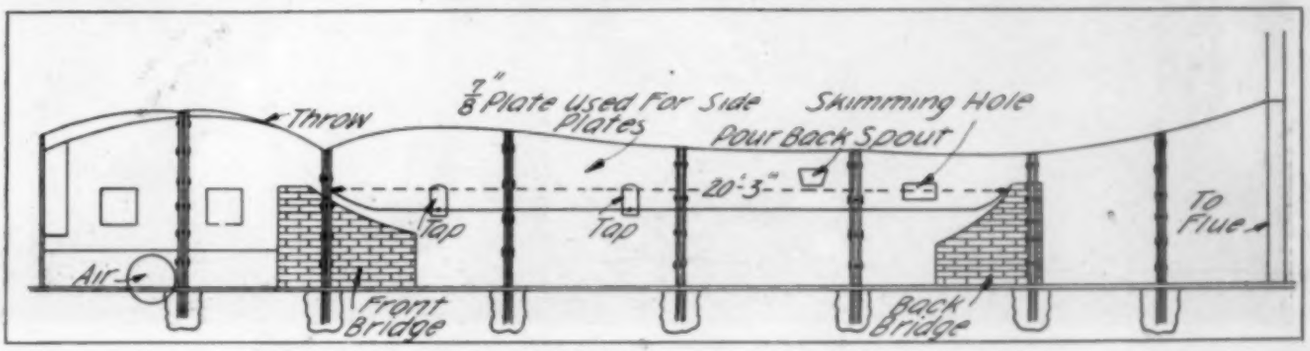


FIG. 1—LONGITUDINAL CROSS SECTION OF NEW MALLEABLE IRON FURNACE

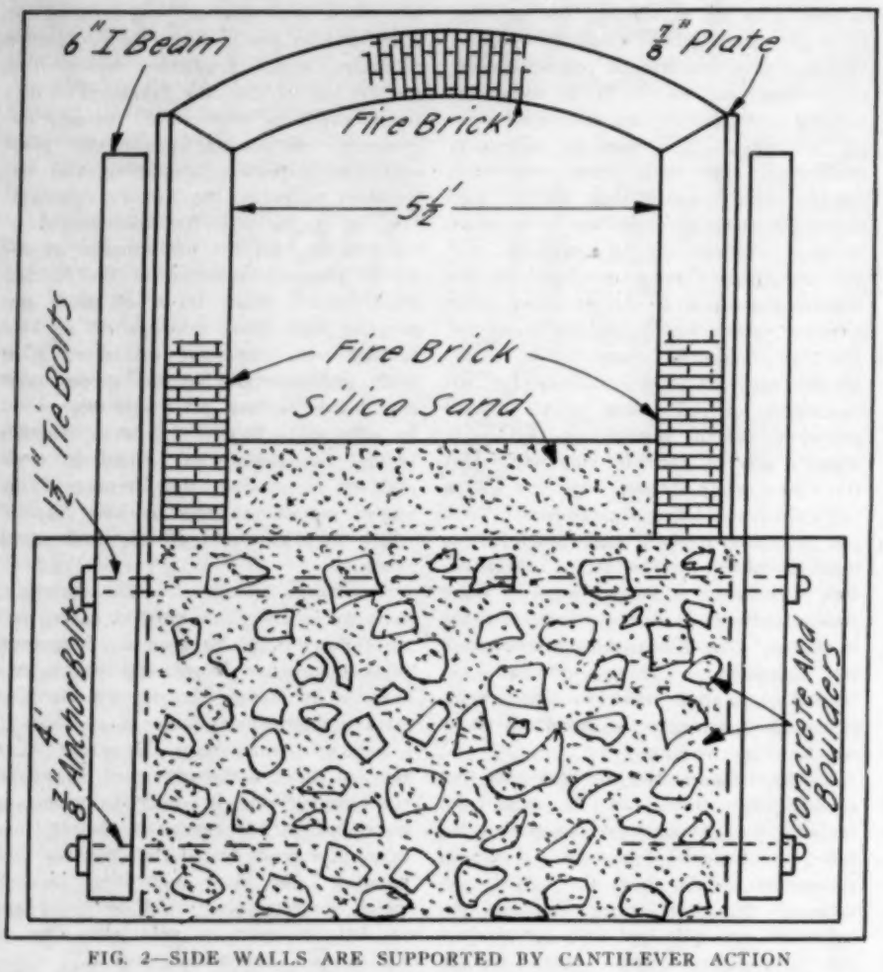


FIG. 2—SIDE WALLS ARE SUPPORTED BY CANTILEVER ACTION

brick, and has a spring of 7 inches An overhead trolley extending along the axis of the furnace makes it possible to remove bungs as desired.

The dimensions and general characteristics are shown clearly in Figs. 1 and 2. The bath of molten metal is 20 feet long, 5 feet 6 inches wide, and about 7 inches deep at the lowest point. The depth of the bath is one of the important considerations in malleable iron furnace operation. It must be kept thin enough to burn out the carbon, silicon, and manganese properly and yet deep enough to make the operation of the furnace efficient. The two new furnaces of the Arcade plant are exact duplicates. Each has two tap holes on each side as shown in Fig. 1. The tap nearest the center is the low point of the furnace bed, the forward tap, being at a point where the bed level is about 1½ inches above the low point.

Details of the side wall construction is of particular interest as it is believed to be unique in furnaces of this type. At each point where the side plates join, a deep pocket has been made in the concrete foundation These pockets are about 4 feet deep, and in each there are two vertical steel beams spaced about 8 inches apart and extending from the bottom of the pocket to the top of the furnace.

A 1½-inch tie rod extends through underneath the furnace and by means of yokes holds opposing pairs of beams firmly in place at about the floor line. The upper portions of the beams then have a cantilever action which makes any other support unnecessary. Lighter tie rods and yokes in the lower end of the beams give additional support for holding the beams in correct position. The yokes are fastened by nuts, making it a simple matter to remove any pair of vertical beams as desired. This construction is shown in Fig. 2.

Operation of the furnace may be

FIG. 3—THE CHARGE OF THIS FURNACE CONSISTS OF 9 TONS OF SPRUE AND 9 TONS OF PIG IRON

outlined as follows: On Sunday the melting chamber is cleaned out. From two to three inches of burnt sand and slag are scraped off of the floor, the walls are cleaned, and fresh sand is put in to replace that which was removed.

This fresh sand is then levelled carefully to the desired contour. The entire bottom then is covered with 1-inch boards and on these the charge is placed through the room. Most of the charge is placed in the second section from the fire box. Six or eight bungs are removed at this point and from here the charge is distributed both ways. The usual charge is about 9 tons of sprue in boxes containing about 100 pounds each. The pig iron is added to make up the complete charge. No scrap is used. In Fig. 3 the sprue boxes are shown ready to be charged into the furnace.

On Monday a fire is started at 9:30 in the morning, and is out at 3:00 in the afternoon. The furnace is then tapped at 3:15; from 35 to 40 minutes being required to draw the heat. For an 18-ton charge of iron 8 tons of coal are used. The temperature in the furnace is kept close to 2950 degrees Fahr. and the analysis of the melt is kept within narrow limits, in accordance with the following specifications: Silicon, 0.85; carbon, 2.65; manganese, 0.30; sulphur, 0.05; phosphorus, 0.18 per cent. According to the report of the plant metallurgist, average samples from both of the two new furnaces have an elongation of 12 per cent in 2 inches and a tensile strength of 55,000 pounds per square inch.

Investigate Titanium

Results of an investigation conducted on titanium are contained in a report recently published by the United States bureau of mines. The pure metal is difficult to isolate, and up to the present has not been used commercially to any great extent. However, the use of alloys and chemical compounds of titanium has increased markedly in recent years. The report contains a description of the physical and chemical properties of the metal, methods and the uses which have been found for the metal. The following are the uses of titanium in the form of alloys: Metallic alloys, such as ferrotitanium and cuprotitanium; incandescent media for lighting purposes, such as gas mantles and filaments for incandescent electric lights; mordants and dyes for leather and textiles; refractory coloring material; pigments for painting; smoke screens for concealment in modern warfare and a number of miscellaneous uses such as the use of rutile for gems, and pure titanium for the production of spectra in astronomical research.

Appoints Committee To Aid Federal Board

A committee recently appointed by the American Engineering Standards committee will work in co-operation with the federal specifications committee in an attempt to eliminate the difference in specifications for government purchases and the usual practice for commercial supplies. The work carried out under the general direction of the committee will give industry a better opportunity to participate in the development of specifications for government purchases. A. H. Hall, assistant treasurer and superintendent of distribution, Central Union Gas Co., New York, is the chairman of the new committee.

In the past, each of the various departments and independent establishment of the government has had its own specifications upon which the supplies were purchased. The diversity of the many government specifications, their departure from the usual specifications followed in commercial production and the special features frequently required became troublesome to the manufacturers and at the same time increased the cost to the government. The federal specifications board was appointed to unite as far as possible the government specifications.

Tests recently conducted by the United States bureau of mines at Pittsburgh leads to the belief that wireless waves may be used in the future as a means of effective communication between rescuers and miners entombed in mines following fires and explosions. In the experiments signals were heard through a 50-foot coal strata, although the audibility fell off rapidly as the distance increased.

Shows Mineral Production

Production and Value of Mineral Products in Michigan for 1920 and Prior Years; cloth, 145 pages 6 x 9 inches, published as a part of the annual report of the Michigan board of geological and biological survey for 1920, and furnished by IRON TRADE REVIEW.

The book is divided into two parts, the first section dealing with the metallic minerals, and the second section with the nonmetallic minerals. Copper and iron ores are the metallic metals mined in Michigan, while salt, bromine and calcium chloride, magnesium, cement, potash, gypsum shale, coal, limestone, etc., and oil and gas constitute the nonmetallic products of the state. Besides giving tables on the copper production, the section devoted to copper also explains why the production of copper decreased in 1920 over 1919. Tables showing the production of iron ore by counties from 1916 to 1920 are also given.

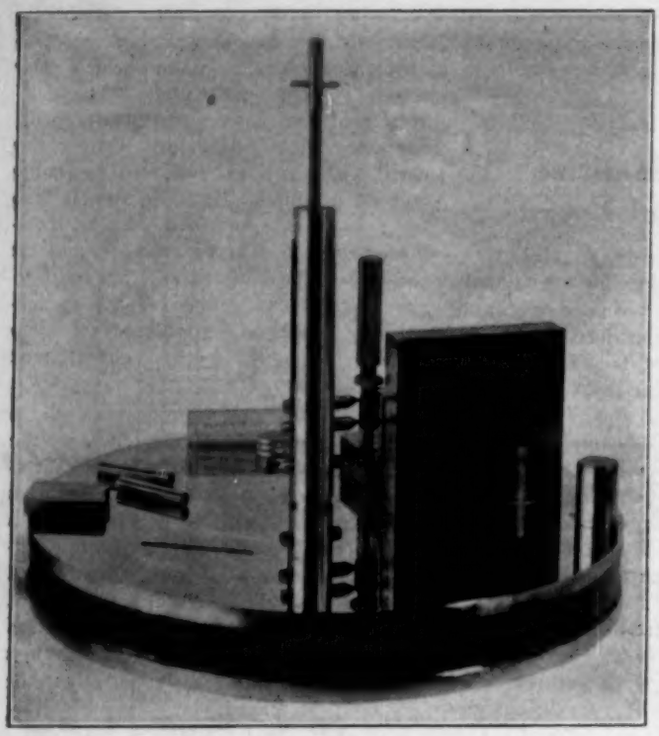
The tables showing the production of nonmetallic minerals are preceded by a comparison of the production in the state of Michigan with the rest of the United States, and with a description of the condition of the various fields. A short discussion of the possibilities for further production of oil and gas in Michigan, together with tables showing the reported discoveries of oil and gas are also given. The appendix consists of a directory of the producers of nonmetallic minerals in Michigan in 1920.

* * *

How To Tin and Galvanize

Galvanizing and Tinning, by W. T. Flanders; 328 pages, 6 x 9 inches; cloth; published by the U. P. C. Book Co., Inc., and for the sale by IRON TRADE REVIEW, Cleveland; price $4 net.

There are several sections that should be of special interest to foundrymen. The chapter on water rolling, tumbling, and sand blasting contains detailed descriptions of the preparation of castings for tumbling, mixtures for cleaning castings, handling delicate castings in tumbling barrels, sand blast, etc. In the chapter on coating gray iron castings with tin, the work deals with dipping the castings, proper heat for tinning, tinning with three kettles of tin. The chapter headed, "Tinning Malleable Iron Castings, Wrought Iron and Steel" takes up plant and equipment, plan of a tinning plant, tools and kettles. The section



SURFACE PLATE FOR USE IN CHECKING DIMENSIONS AND INSPECTING PARTS

on preparing gray iron castings for tinning contains a close description of the various methods used for removing sand from castings. "Galvanizing Specifications and Tests" is a chapter of 25 pages explaining the requirements and the numerous tests. The remaining 27 chapters thoroughly cover the remaining points in the process of galvanizing and tinning. Practically every phase of the subject is completely explained and diagrammed. Over a hundred photographs and drawings help to explain the test and add to the interest of the book.

* * *

Discusses Testing Materials

Elasticity and Strength of Materials Used in Engineering Construction, Section I, by C. A. P. Turner; cloth, 85 pages 5¾ x 9¼ inches, published by the author and furnished by IRON TRADE REVIEW, Cleveland, for $5 net.

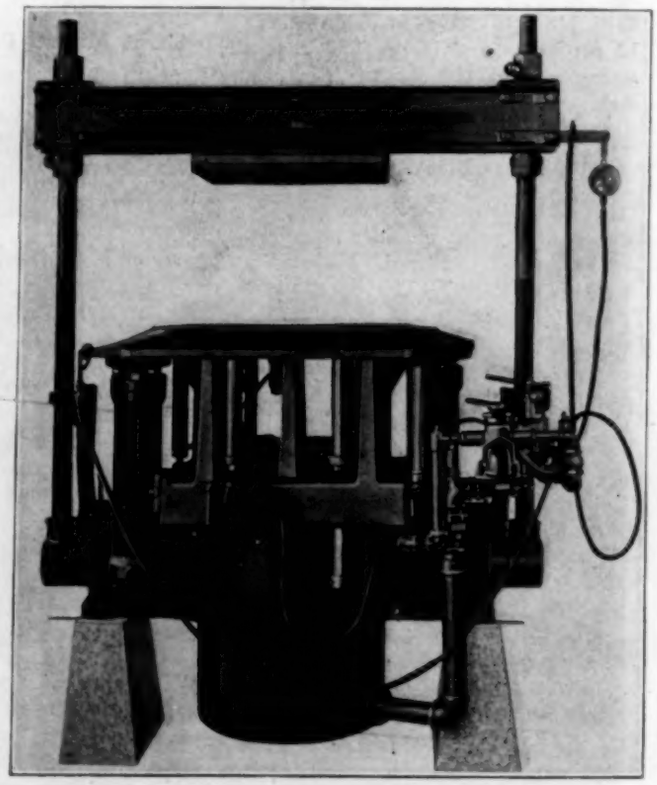
Large sums are wasted yearly in an effort to provide for the supposedly injurious effect of moderate ranges of stress, which really improve the metal. At the same time heavy loss is suffered by failure to exercise practical judgment in the proportion and selection of material to resist shock in cases where the stress may at times exceed the natural range of elasticity employed.

This book is intended to demonstrate fundamental principles upon which rational analysis may be founded and to discuss the properties of commonly used materials from the standpoint of the elastician so that the student may apply the analytical methods understandingly and in a scientific manner. A development of the relations of residual to elastic strain sufficient to account for elastic phenomena is presented and the error resulting from general misunderstanding of these relations is discussed. It is demonstrated that there is but one independent modulus of elasticity for the resistance of a homogeneous isotropic solid, and the relative value of the co-efficients for such a body and their modification by residual strain are investigated. Stresses are discussed from the thermodynamic standpoint and also from the relation of kinetic and static modulii.

Pattern Machine Built in Larger Sizes

A large jolt, squeeze, split-pattern machine has been introduced recently by the Hanna Engineering Works, Chicago. The machine will accommodate a 24 x 24-inch flask, has a 12-inch pattern draw and is 56 inches between strain rods. The height of the swing yoke may be varied on the tubular strain rods by adjustment of the split strain rod nuts. The counter tension device permits adjustment of the counter tension spring by the operator so that when the swing yoke is in the rear position it can be swung to the upright position with ease by the operator. The ramming head construction is the same as followed in the manufacture of smaller machines. Pattern drawing is accomplished by two automatic slow start oil pattern draft cylinders controlled by a knee valve. While the mold is being carried to the floor the flask frame settles to its original position and the machine is ready for the next flask.

The pattern draft guide plungers have a bearing surface on the cylinders the entire distance, which should assist in the pattern draw. Jolting is accomplished by a one-piece heat treated, no spring jolt valve which is inserted through the side of the cylinder and protrudes into a pocket which is longitudinal with the axis of the plunger. Both side walls of this pocket have machined strips which are parallel to each other and to the axis of the plunger. On the inside end two flats have been milled on opposite sides and parallel to each other, thus forming a cubical plug which just fits between the flats on the sides of the pocket in the plunger. All the surfaces in the plunger are provided with a lubricating system and are protected from sand and dust.



NEW JOLT, SQUEEZE, SPLIT-PATTERN MACHINE FOR LARGE WORK

Develops Lapped Steel Surface Plates

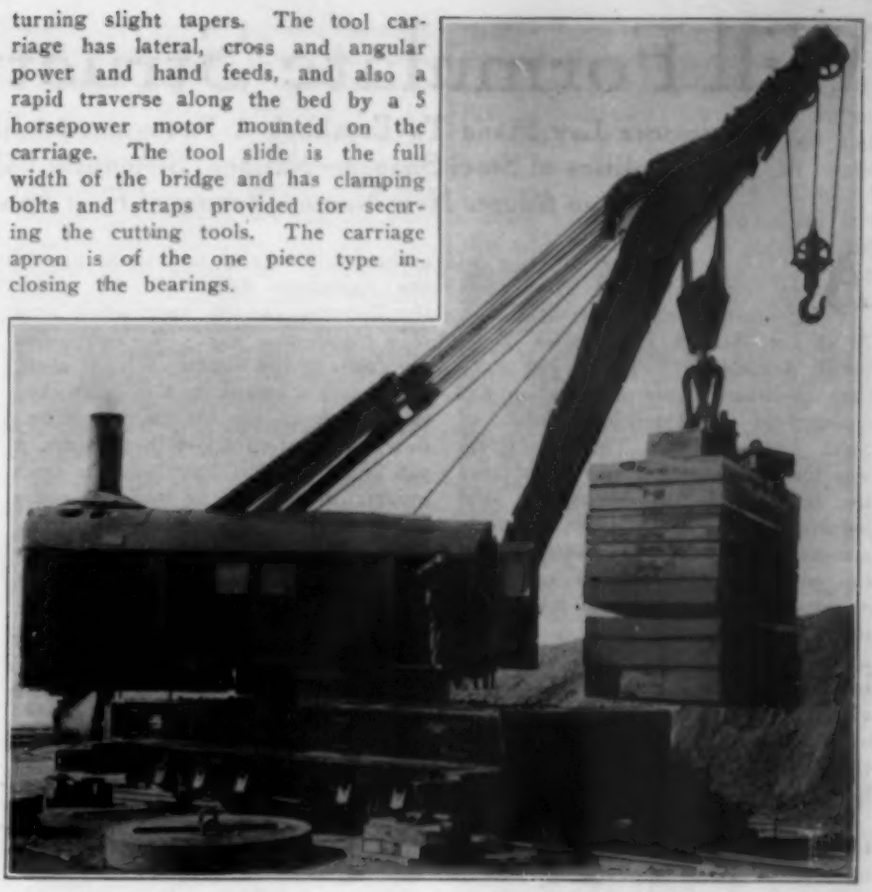
A series of lapped steel surface plates has been developed recently by the Van Keuren Co., Allston, Mass. These plates are furnished in convenient sizes, and

are useful for the inspection of small accurate manufactured parts, for checking dimensions, for sine bar set-ups, and for any of the many uses common to surface plates. The illustration shows one of the plates with an assortment of tools placed on it. The plates are said to be more accurate than the usual cast iron hand scraped plate. One advantage claimed for the plate is that gage blocks may be rung directly on to the lapped surface. The plates are circular, and are made in 5, 8, and 10-inch diameters.

Builds Swing Lathe of the Heavy Type

The Niles-Bement-Pond Co., 111 Broadway, New York, recently introduced a 60-inch swing lathe of the heavy type. The lathe, as shown in the accompanying illustration, is equipped with a constant-speed, 40-horsepower motor and has 24 face-plate speeds obtained by speed change gears operated by a lever located on the headstock. Where an adjustable-speed, direct-current motor can be used, the geared speed change can be omitted without reducing the speed range of the face plate. The control of both direct and indirect motors is located on the carriage where they can be operated conveniently.

The headstock is of heavy design and entirely inclosed as a protection to the operator and the gearing. The faceplate has four pairs of parallel slots at right angles to permit the attachment of heavy steel face plate jaws. The tail spindle is of large diameter in order to provide stiffness and has double clamping bolts for holding in position when set. The upper portion of the tailstock has a cross adjustment screw for use in turning slight tapers. The tool carriage has lateral, cross and angular power and hand feeds, and also a rapid traverse along the bed by a 5 horsepower motor mounted on the carriage. The tool slide is the full width of the bridge and has clamping bolts and straps provided for securing the cutting tools. The carriage apron is of the one piece type inclosing the bearings.

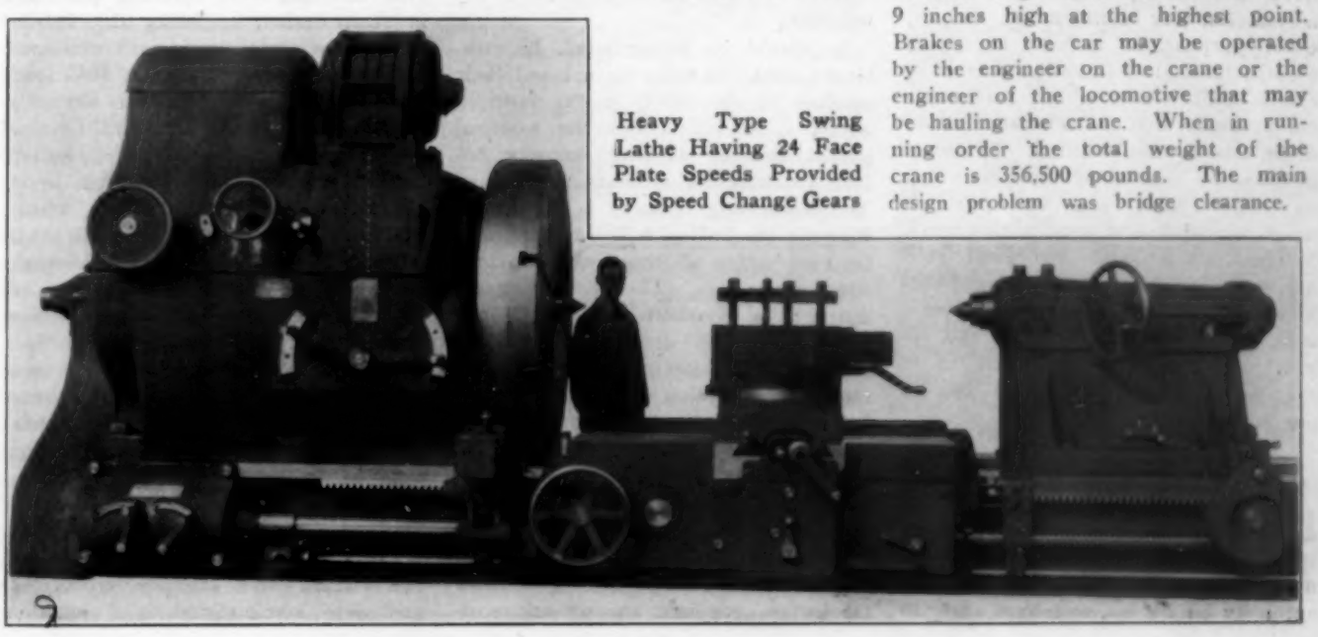


LARGE RAILWAY WRECK CRANE WHICH HAS A LIFTING CAPACITY OF 400,000 POUNDS. THE CRANE WEIGHS ABOUT 180 TONS

Constructs Large Crane for Railway Use

One of the largest railroad wreck cranes built was completed recently by the Industrial Works, Bay City, Mich., for the Virginian Railway Co. This crane has a capacity on the main hoist of 400,000 pounds at a 17½-foot radius with all outriggers, 200,000 pounds with end outriggers only and 85,000 pounds without outriggers. The auxiliary hoist has a capacity of 90,000 pounds at a 24-foot radius with end outriggers only.

The crane is mounted on special 6-wheel trucks and has a maximum axle load when in running order of 64,000 pounds. The car has a total wheel base of 26 feet 2 inches and is 34 feet long. The crane is 15 feet 9 inches high at the highest point. Brakes on the car may be operated by the engineer on the crane or the engineer of the locomotive that may be hauling the crane. When in running order the total weight of the crane is 356,500 pounds. The main design problem was bridge clearance.



Heavy Type Swing Lathe Having 24 Face Plate Speeds Provided by Speed Change Gears

Will Formulate Structural Codes

Fabricators Lay Plans To Establish a Recognized Authority on the Physical Qualities of Steel Shapes—National Structural Fabricators Association Adopts New Name—Report of First Annual Meeting

AT THE first annual meeting of the National Steel Fabricators association, which was held Nov. 23 at the William Penn hotel, Pittsburgh, and attended by over 100 members, the name of the organization was changed to the American Institute of Steel Construction. The association was formed early this year to advance the interests of the structural steel industry and Lee H. Miller, formerly associated with the Bethlehem Steel Co. at Cleveland, selected managing director to interest enough fabricators to justify the undertaking of the associations' work. In five months the membership increased to 113. An elaborate program, described as the most constructive effort undertaken in the fabricating industry, is about to be inaugurated.

In this connection Mr. Miller during the morning session declared the most obvious circumstance surrounding the structural steel industry is that there has been a constantly decreasing demand for the product since the first records were started in 1912 by the Bridge Builders and Structural society. These records indicate a total decrease in the nine years from 1912 to 1921 of about 55 per cent. Materials, which have supplanted structural steel, have increased about 1000 per cent in that time, due to intensive effort in exploitation. He stated this has happened in face of the fact that there never has been produced or marketed a material for construction or any other purpose, as uniform in quality as structural steel is today. Inside its elastic limit it acts with a mathematical accuracy that is unknown in any other construction materal. It cannot possibly be injured by stresses within its elastic limit, and this point is never approached in construction work. Medium open-hearth structural steel has an elastic limit in the neighborhood of 40,000 pounds per square inch, and a slight increase in the silicon content raises this point to in the neighborhood of 45,000 pounds per square inch.

Industry Lacks An Authority

In spite of the extensive individual distributed knowledge regarding structural steel, he continued, there has never been established a recognized authority on its use, and until such an authority is created and given power, the numerous difficulties that beset the industry can be approached only in a clandestine way. No two building codes in the country are the same, and unless a means soon is established to co-ordinate the various movements now operating to revise these codes, it will be but a short time before a much greater divergence in building codes will exist. The fact that there now is no recognized authority, needs no extensive discussion; and the fact it does not exist is sufficiently convincing that one should be developed. If the necessity of an authority on structural steel can be accepted, it next becomes necessary to determine where such an authority should be located. It is true that the catalogs issued by various mills are the source of information regarding steel today but these extensively are reprints of catalogs appearing 35 years ago; their extensive distribution is one of the greatest difficulties in creating a uniformly recognized authority. These books were devised to exploit the sale of the product of the various mills, whose interest in the subject is confined principally to the making and rolling of steel shapes, and not to the conditions under which they are used in construction. In fact, when a mill or an engineering firm wants the services of a man qualified to design or discuss the uses of structural steel, they recruit him from the fabricating industry.

It should be remembered, he continued, that the mills do not sell their product to the public in the form in which it is rolled, but the material passes through another industry before reaching its ultimate destination. The fabricating industry is the bridge between the rolling mills and the public, over which all structural steel tonnage must pass. The fabricating industry is in constant contact with the engineering and architectural professions, building commissioners, and the ultimate purchasing of structural steel. It therefore is apparent that the authority should be located where the talent and the means of exploiting its increased use exists.

Before explaining how this association prospects to create the scepter of its authority, a brief history of how fabricators got into the present position as to building codes and handbooks would not be amiss. Carnegie Bros., in 1876, published a handbook which was probably the pioneer text book of construction in iron. It contained elaborate data on elementary arithmetic, and was devised to enable a man from a templet shop to become in engineer. At that time only iron sections were rolled, as the bessemer process was not yet introduced. These wrought iron sections were formed by welding together several wrought iron bars by a rolling process similar to the present method of rolling stay bolt iron and chain iron. In 1884, Carnegie issued a more elaborate book and other mills began about this time to issue similar information regarding their product. About 1887 the bessemer process came into use in America as a result of a naval contract for two battleships requiring that the steel be of domestic production.

Includes Steel Sections

In 1889, Carnegie-Phipps published a book showing both wrought iron and steel sections. By rolling from an ingot, it was possible to get a wider flange and a thinner web with greater economy than was possible in the iron sections. This bessemer material, however, had many objectionable properties, including that of being brittle and uncertain, which resulted in a campaign by the technical press to prevent its use. Our present practices in steel design, including the 16,000-pound unit stress came into existence in this book of 1889, and in 1893 steel had progressed so far that Carnegie confined its production of rolled sections entirely to steel. The opposition to bessemer material resulted in a gradual development of the open-hearth process, with the result that one by one, the bessemer converters were replaced, but the process was so gradual that it is impossible to say just when it was completed. In fact there are yet a few mills which use bessemer material for small bar-sized sections. The campaign of the technical press also bore fruit in another way—as it resulted in many cities enacting code regulations on the use of steel.

Previous building codes dealt with fire hazard and sanitary conditions, and were administered as a function

of the fire departments. With the codes dealing with technical questions of safety of structural design, the function of administration passed to what is now our technical building commissioners. An examination of these codes reveals that they essentially are copied extracts of specifications and formulas appearing in mill handbooks 35 years ago, and it is not entirely unreasonable to consider that except for new sections, the mills continue to reprint without alteration, the data as it appeared in their books 35 years ago. The bessemer converter brought with it many objectives, including rigid inspection, building codes, and unparalleled demand for technically trained men, high multiple story steel structures, and a campaign to prevent the use of bessemer steel, which resulted in the development of the open hearth. Steel was first mentioned in the Cleveland building code in 1905.

Handbooks Lack Co-ordination

The most striking circumstance connected with the past of the steel industry is the fact that such rapid strides have been made in the metallurgic processes, in the rolling improvements in the knowledge regarding design, in methods of fabrication, and erection, and in inspection, but against these developments was the failure to provide an authority that would permit exploiting the full economy of steel. If only one mill handbook now existed, it might be used as a basis of creating an authority, but so many make it difficult to obtain coordination. An effort originating among the mills to confine their data to one source would in itself be difficult to effect, and might bring forth suspicion not only among themselves but with the public, as to the motives involved. On our part we frankly admit that we want to increase the demand for steel by bringing about conditions that permit its economical use. To make this association the recognized authority something must be done that will be accepted and welcomed as constructive by the mills, the engineering profession, the architects, the building commissioners, and the purchasers of steel.

A committee of the most eminent talent now is being selected to recommend a proper unit stress and column formula for steel constructon. Based upon their recommendations, a set of loading tables for all the sections rolled by the various mills will be published. One of the serious objections to the present mill handbooks is that it has encouraged the handbook engineer. By omitting the use of the word "safe" and stating that tabulated loads produce the stress conditions recommended by the committee, empirical handbook engineering will be made more difficult than at present. That is, if the associations' committee recommends a unit stress of 20,000 pounds for beams in bending, the proposed tables will state that the uniformly distributed load produces a stress of 20,000 pounds in the extreme fiber of the beam instead of stating as present books do that the tables give the safe loads. Under present conditions the word "safe" is relative and does not mean the same in different cities.

In addition to the foregoing information on beams subjected to bending, the proposed tables should show the maximum strength of the web to resist buckling, and also the maximum strength of the web to resist shear. These items are omitted from many tables, but often are of utmost importance in design. The mills will be asked to adopt the standards of this association in their books. Concrete evidence then can be placed before engineers, architects, building commissioners and the public that the mills which originated present practices have accepted the standards of this association as authority. Unqualified approval has been expressed freely and there are several large cities ready to recommend our standards as their building code as soon as they are established. A certain commissioner has asked to receive our recommendations as soon as possible, as he wishes to urge their immediate adoption. The work will not end when uniform code regulations have been established, as there is yet much work to be done in bringing the matter of steel construction more prominently into the college courses. Then there is the question of fire-proofing which can be better approached when this association has been recognized as a power. Along with this is the matter of development of new fields for the use of steel such as in residence construction. Some members may believe that this is a matter far in the future but a few figures will reveal that under present conditions steel is cheaper than wood.

Field Offers Opportunity

A 7-inch 10-pound channel is stronger than two wood joists 2 x 12 inches; at present comparative mill prices, the steel cost 22 per cent less in addition to saving two brick courses on the exterior wall of a residence. Labor must be added to the cost of both elements and under present conditions labor is about 65 per cent of a residence against 35 per cent in material. These figures were obtained from a reliable architect, whose work largely is in residence construction. Properly exploited, this field offers an opportunity for greater tonnage and profit than now exists in all other fields.

These prospective changes will enable fabricators to exploit an increased demand for steel in many new fields which in 10 years should be many hundred per cent above that of last year, without considering the new sections which the mills soon will produce. It is not extravagant to state that this association today is launching a new era in the structural steel industry, and all that is needed is patience and support to guarantee success.

Question Method Of Finding Weight

Another point called to my attention by a leading architect as a subject which should be corrected promptly, is that of how the calculated weight of a steel contract should be determined. That is, should the calculated weight include in addition to the weight of the main members, such items as the total weight of the rivets used, and in the case of gusset plates, should it include the weight of the corners of the plate clipped off to make a presentable appearance. What weight should be included for the first coat of shop paint and what for the second, if specified? This architect pointed out that fabricators purchase from the mills their material based on catalog weights, and this association could determine whether or not structural steel should be sold on catalog weights as purchased, or on scale weights. He pointed out that these questions were a bone of constant contention in almost every steel contract, and that the architectural profession would welcome a standard ruling from an association such as ours, which could be pointed to as the recognized authority saving them from a constant discussion on this subject. In his opinion, it is a matter of indifference to the architectural profession, just what this ruling should be but is of utmost importance that this association should establish something that they could refer to as basic. At this part of his discourse, Mr. Miller recommended that a committee be appointed to investigate and recommend a standard practice on this and other vital points. This latter was done.

Continuing, Mr. Miller stated the association also could be of enormous value in bringing about uniform practice in tank construction. While this industry is not conducted in all cases as a part of the fabricating industry,

it so completely overlaps in many cases that the association is in a position to contribute valuable assistance. As the industry now stands, unit stresses vary from 12,000 to 25,000 pounds per square inch making it impossible for the bidder to tell whether he is in competition with unit stresses or his competitor's fabricating costs. In addition the possibility exists that in many cases the liquid contained has a very wide range in specific gravity, making the resultant stresses dependents upon the specific gravity used by the designer. Then again, there is the question of rivet spacing and whether or not the rivets are driven hot or cold. The subject is large and should be included in the work of the association.

Another subject on which our association could begin work immediately is that of a uniform telegraphic code for the use of the entire industry, including mills and fabricators. Undoubtedly, such a uniform code would contribute much to the economy of telegraphic correspondence in our industry. An important question now before this association is to what extent the mills will support its work financially. My conversations with the various mills lead me to believe that there will be no stinting on their part, once the fabricators have shown a willingness to pursue a constructive program, as is that of our association, and I am confident that when the rolling mills have evidence that we are taking the matter seriously they will come forward with support.

It should be remembered that at present all fabricators in this country are not members of this association. Some have not been approached with a clear explanation of the association's plans; others are waiting to see whether the association is real or not. The program of this association is to benefit all fabricators and mills and members have a moral right to look to them for help, now when it is most important. Care should be exercised not to attempt any part of our program until able to carry it through to completion. Our industry has been the victim of much unwarranted and sometimes almost vicious practices by influences external to ourselves but these can be corrected with great benefit to the industry and pubic.

The success of any club or association, whether it be social, religious, political or industrial, Mr. Miller pointed out, cannot succeed and thrive unless they have a definitely established objective toward which they are working. In addition, success depends upon the process by which they hope to obtain this objective. This association has both the objective and the process of obtaining it so well defined that success is assured.

Another point, which, as fabricators, we should remember is that if the mills hope to increase the demand for structural steel, there is but one bridge over which this outlet can be increased and that is through the fabricating industry. If steel is to be brought into universal use, it must be done by the processes of developing and increasing the number of outlets to the public and making it promptly available for all occasions. This is one of the fundamental principles of merchandising and any attempt to restrict the number of outlets to the public will react by a decrease in the demand for the product.

Urges Standardized Practices

This association ultimately must make steel so easily available that the matter of delay in obtaining it will not interfere with its sale. Unless something is done inside of the steel industry to codify and establish standard practices, it will be accomplished by movements that already are being initiated from the outside and if continued will operate to our disadvantage. Various divisions of the department of commerce are now working on the matter of building codes and simplified practices and will welcome our co-operation.

Up to the present time the fabricators who have reported as to their tonnage, have an average of about 15,500 tons per annum, which should give a total fabricating capacity in our association as it now stands of approximately 2,000,000 tons per annum. With this back of us we will establish ourselves not only as the recognized authority on steel in this continent, but throughout the world.

In concluding Mr. Miller quoted from a letter written by Herbert Hoover of the department of commerce dealing with the public value of organizations as follows:

"The studies carried out in the department of commerce during the last year convince me that there lies in these associations a road for the elimination of vast waste in our whole industrial system through the development of co-operation without destroying competition. The legitimately formed associations have contributed greatly to the improvement of business morals and practices; have cheapened our production and distribution processes; have improved working conditions; have by the statistics they publish of production and distribution, enabled our whole commercial public to form safer judgments as to their future policies; have contributed to the advancement of our foreign commerce; and generally have interested themselves in our economic welfare. These services should be preserved and even better organized."

Considerable discussion followed Mr. Miller's paper and his suggestions unanimously were adopted. Standardization was advocated at the close of the morning's session by W. A. Durgin, chief of the division of simplified practice, department of commerce, Washington. He pointed where products such as bricks, axes, shoes, etc., have been standardized, substantial savings have been effected and that the adoption of this procedure by the fabricating industry would reap similar results. Following a luncheon the members of the association were addressed by Mr. Parlin, statistical director, the Curtis Publishing Co., Philadelphia, who spoke on association advertising.

A meeting of the board of directors of the American Institute of Steel Construction was held at the termination of the luncheon session at which A. J. Dyer, G. E. Klingelhofer and C. A. Russell were elected and W. M. Wood and C. A. Snyder re-elected to serve on the board J. L. Kimbrough is president and W. M. Wood is vice president of the American Institute of Steel Construction which maintains offices at 1052 Leader-News building, Cleveland.

To Develop Waterpower

Washington, Nov. 28.—In the year which ended last June, 30 applications for the installation of waterpower projects contemplating 5,000,000 horsepower were received, the federal waterpower commission states in its second annual report. This makes applications for the development of more than 20,000,000 horsepower which the commission has entertained. The commission points out that more waterpower development is under way than at any previous period and that waterpower offers the cheapest power and the logical solution of the fuel problem. Eighty-five per cent of the waterpower resources of the United States fall within the control of the federal commission.

To Sell Surplus Material

Washington, Nov. 28.—Sales of surplus war material scheduled by the war department for December include the auction of ordnance material at Rock Island, Ill., and Morgan, N. J., on Dec. 13, the auction of ordnance material at Middletown, Pa., on Dec. 19, the auction of the Symington plant at Chicago on Dec. 7, and the taking of sealed bids on ordnance material at Rock Island on Dec. 6.

Repair Many Locomotives

Washington, Nov. 28.—The railroads repaired and turned 13,490 locomotives out of their shops in the last half of October, 2086 more than in the first half of October and a greater number for a semimonthly period than has been repaired in the last two years, the American Railway association states. Locomotives in need of repair on Nov. 1 totaled 18,366 or 28.5 per cent of the number on line. This was a decrease of 865 from Oct. 15. Speeding of repair work has been noted since the strike.

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

THE first conference of Indiana foundrymen was held at Purdue university, Lafayette, Ind., Nov. 23-24 for the purpose of promoting better foundry work in the state. Prof. W. A. Knapp, assistant director, engineering experiment station, Purdue university, presided at the first meeting. Talks were given by Prof. J. D. Hoffman, head of the department of practical mechanics, Purdue university and David E. Ross, Ross Gear and Tool Co., Lafayette, Ind. At the afternoon session R. E. Wendt, Lafayette, spoke on "Foundry Conditions in Indiana." F. D. Chase, F. D. Chase, Inc., Chicago, spoke on "Layout and Design of a Modern Foundry." "The Manufacture of Pig Iron" was the subject discussed by H. B. Northrup, Diamond Chain Co., Indianapolis. N. W. Waterbury, Link-Belt Co., Indianapolis, concluded the session with a talk on "The Manufacture of Malleable Iron." A. J. Tuscany, secretary Ohio State Foundrymen's association was the principal speaker at the session on Thursday evening.

The following talks were given at the Friday session: "Warpage of Iron" J. F. Keller, engineering extension service, Purdue university; "Metallurgy in the Foundry" J. C. Hopp, C. C. Kawin Co., Chicago; "Why Research Pays" H. C. Peffer, school of chemical engineering, Purdue university; "'Foundry Costs" E. T. Runge, E. T. Runge Cost Co., Cleveland. Friday afternoon the visitors were taken on a tour of inspection of the shops at the university. A grav iron heat was taken off by the students in foundry practice. The conference closed with an illustrated lecture by H. L. Campbell, assistant professor of metallurgy, University of Michigan, Ann Arbor, Mich.

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Pittsburgh Foundrymen Meet

At the regular monthly meeting of the Pittsburgh Foundrymen's association, postponed from Nov. 20 to Nov. 22, held at the General Forbes hotel, Pittsburgh, E. J. McDonnell, described fully open-hearth combustion systems. Mr. McDonnell is sales manager of the open-hearth combustion system division of the Blaw-Knox Co., Pittsburgh and Blawnox, Pa.

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Talks on Transportation

Thomas Fitzgerald, consulting electrical engineer of Pittsburgh, presented a paper on "Planning Mass Transportation Facilities" before the members of the Engineers' Society of Western Pennsylvania, Nov. 21, in the William Penn hotel. A general discussion followed the reading of the paper. Mr. Fitzgerald showed that the growth of industry was regulated by transportation facilities at hand and indicated the correct forms of traffic vehicles to meet the needs of different communities.

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Speaks on Combustion Systems

At the Nov. 22 meeting of the Pittsburgh Foundrymen's association, plans were formulated for a Christmas party to be given Dec. 18 at the General Forbes hotel. E. J. McConnel, sales manager of open-hearth combustion division of the Blaw-Knox Co., Pittsburgh and Blawnox, Pa., was the speaker at this meeting. He described the new open-hearth combustion system just being introduced in Pittsburgh plants. Improvements in open-hearth furnace operation were outlined, with particular regard to port construction as embodied in McKune and Egler furnaces.

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Talks on Tool Steels

Dr. John A. Mathews, president of the Crucible Steel Co. of America, Pittsburgh, outlined the development of alloy steels during the last century at a meeting of the Cleveland Associated Technical societies at the Hotel Winton, Tuesday evening, Nov. 21. Dr. Mathews said that despite the research which has taken place on the subject, little is known of the interrelations of the 10 or 12 elements such as nickel, chronium, tungsten and vanadium in complex high-speed steels. He pointed out that new and valuable properties would be discovered in steels from time to time. Among such properties, the ability to resist corrosive agents to a high degree already has been embodied in laboratory steel.

* * *

Lecture at Carnegie Institute

Dr. Irving Langmuir, research physicist of the General Electric Co., Schenectady, N. Y., gave a series of three technical lectures at Carnegie Institute of Technology on Nov. 27, 28 and 29. Scientists, engineers and researchists throughout the Pittsburgh district responded in large numbers to the invitations sent out by those in charge of arrangements.

Convention Calendar

Dec. 4-8—American Society of Mechanical Engineers. Annual meeting in Engineering Societies building, New York. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Dec. 6-7—American Institute of Chemical Engineers. Annual meeting at Hotel Jefferson, Richmond, Va. J. C. Olsen, Polytechnic institute, Brooklyn, N. Y., is secretary.

Dec. 7-13—The National Exposition of Power and Mechanical Engineering at the Grand Central Palace, New York.

Jan. 11-12—American Engineering Council. Annual meeting headquarters F. A. E. S., 24 Jackson place, Washington. L. W. Wallace, 24 Jackson place, Washington, is secretary.

Feb. 14-16—American Institute of Electrical Engineers. Mid-winter convention, New York. F. L. Hutchinson, 29 West Thirty-ninth street, New York, is secretary.

Feb. 19-21—American Institute of Mining and Metallurgical Engineers. Annual meeting in Engineering Societies building, New York. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

April 3-7—American Chemical society. Spring meeting New Haven, Conn. L. Parsons, P. O. Box 1515, Washington, is secretary.

April 30-May 3—American Foundrymen's association. Annual convention and exhibition at Public Hall, Cleveland. C. E. Hoyt, 140 South Dearborn street, Chicago, is secretary.

May 3-5—American Electrochemical society, semiannual meeting, Hotel Commodore, New York. Colin G. Fink, 327 South La Salle street, Chicago, is secretary.

Lay Stress on National Problems

Speakers at Meeting of National Founders Association Urge Revision of Immigration Laws, Defend Present Judiciary System Against Attacks, Sponsor Hiring of College Trained Men and Outline Railroad Situation

RELIEF from the restrictions of the present immigration law, a federal investigation of trade unions and a definite program for the training of apprentices were among the more important steps urged at the twenty-sixth annual convention of the National Founder's association, at the Astor hotel, New York, Nov. 22-23. President W. H. Barr stressed particularly the necessity of a revision in the immigration law. The restrictions of this law, he declared, are largely responsible for the fast growing shortage of labor, and unless some early remedy could be devised, it would definitely check what he believed will be a period of genuine prosperity in the coming year.

While the past year has been a lean period, according to most members in attendance, the last half has been showing a distinct improvement. At the same time, there has been little labor trouble. Commissioner A. E. McClintock stated that the association was called upon to handle but nine strikes, involving 222 molders, of which four of the strikes are now inactive. Seven of the nine shops he said, are devoted to the manufacture of heavy and complicated castings and for many years had been closed union shops. Mr. McClintock, in touching upon the growing scarcity of labor, said that even now with the foundries operating at approximately two-thirds of their normal capacity, there has begun a scramble for molders and that labor agitators are already at work.

Upholds Judiciary System

An interesting feature was an address by James A. Emery, association counsel, who pointed out the grave dangers in the agitation now fast gaining ground in some sections of the country for restricting powers of the federal judiciary system. He said that if Congress were given the power to review Supreme Court decisions as now proposed, business would be thrown into utter chaos within a short time. In the event of such a change, the remedy, he said, would no longer be judicial, but purely political, with all decisions based on the ever changing sentiment of the people; in short, subjected to their whims every two years. Such a condition would result in an uncertainty that would make business impossible, Mr. Emery stated.

He traced the development of the present system, went into its history, outlined the discussions which took place in the early days of the formation of the constitution, and enumerated some of the more important underlying principles. Mr. Emery stated that the present agitation was not to be found alone among the labor classes, but among many of the so-called intellectuals, and that the movement was more widespread than he believed the country at large realized. He felt that it should be met with the determined opposition of every thinking person who has the welfare of the nation at heart. At the close of Mr. Emery's address, the members paid him the distinct tribute of arising as if of one accord and giving vent to prolonged applause.

Take Action on Immigration Problem

A resolution was passed by the association urging that Congress "replace our present negative and unscientific handling of the alien, with a definite policy of immigration." A model bill now is being prepared by a committee of the National industrial council, representing a number of national business organizations. It was also announced that a foundry code, sponsered by the American Foundrymen association and the National Founders association had been adopted by the American standards committee.

At the closing session, Wm. H. Barr, of the Lumen Bearing Co., Buffalo, was re-elected president; J. M. Taylor, of Chicago, secretary, and the Chicago Trust Co., treasurer. Charles L. Taylor, of the Taylor & Fenn Co., Hartford, was elected vice president to succeed Mathew Griswold of the General Electric Co., Schenectady, N. Y. The annual convention dinner was held in the evening of Nov. 22, with Samuel Harden Church, president of the Carnegie Institute of Technology, as the principal speaker.

President Barr, in touching upon the need of a change in our immigration laws, said:

"I venture to predict that a period of genuine prosperity during the coming year will be limited and checked by an unskilled labor shortage, a situation which is due largely to the workings of the present immigration law. It seems to be impossible, however, to convince our lawmakers of this fact. There were certain social conditions which, two years ago, made it desirable to restrict immigration, but instead of enforcing the then existent law which amply protected us, or putting into effect a selective system effective at the point of embarkation, we adopted the present unintelligent method of a three per cent quota under which the lucky ones traveling in the first ship to arrive are sure of admission, while the competent and effective immigrant coming in a little later may be turned back. We also have so-called literacy tests, the intent of which is to deprive us of the unskilled labor which represents in a large degree the honest, hard working, conscientious immigrant. He is shut out, for absurd reasons, although we need him most, and in a few years he would make one of our most desirable citizens."

President Barr set up a strong defense for the open shop, describing it as "a vivid expression of the determination of the American people to compel an industry the same general rights, privileges, and freedom which the people enjoy under our form of government." Unionism, he said, as practiced today is a nullification of the constitution. He urged a federal investigation of trade unions and enumerated a list of questions which he believed Congress should answer in establishing the value of unions to the public. Mr. Barr's address was reported in greater detail in last week's issue of IRON TRADE REVIEW.

Commissioner McClintock, commenting on the need of the comprehensive and definite program for the training of apprentices laid special stress upon obtaining the services of graduate engineers. "The foundry industry is not attracting to itself men of sufficient calibre or men who are big enough to become superintendents and foremen. Today, nearly all foundry executives are promoted from the sand heap. Many lack education, and executive ability and are not sufficiently progressive to utilize to the fullest extent such mechanical devices as have been perfected and as a consequence the foundry business does not progress in keeping with other lines."

He said that within the past year the association has been in receipt of letters from a number of young graduate engineers, stating they desired to make the foundry their life's work. But they feel that they must be self-supporting and as the starting salary is usually insufficient to enable them to do this, the association has found difficulty in placing them. In some other lines, companies are sending men to universities so that they may hire them later offering them from $100 to $150 per month starting salary. He believed that if these other companies have found it profitable to do this, many foundry concerns would find it advisable to at least to pay a fair starting salary.

The open shop, Mr. McClintock said

is better understood than ever before. The recent coal and rail strikes have done much to educate the public in industrial controversies. The workmen, he declared, must have driven home to him the fact that the standard of living is based on production and consumption. Increased individual production is the road to plenty; there is no other way, commissioner McClintock added.

Health Is Important Factor

"The Physician in Industry" was the subject of an interesting address by J. J. Moorehead, M. D., chairman of the conference board of physicians in industry. He outlined the work of the board in standardizing first-aid equipment and systematizing methods of treating disabled and diseased employes, emphasizing the importance of properly recruiting an organization at the outset.

The board, he said, has divided applicants into three classes, similiar to the system employed in recruiting the army in the recent war. The first is based on the consideration of the applicants menace to himself; the second, to others; and the third, to property. Examinations, Dr. Moorehead declared, have become so standardized, that it is possible to examine an applicant at the rate of one every six minutes, on an average.

L. F. Loree, president of the Delaware & Hudson railroad, in an address on "The Railroad Situation," declared that the railroads would likely attain normal shop production in December, but added that he did not expect equipment to reach a normal condition before July. The number of locomotives in need of immediate repair at the beginning of this month amounted to 24.7 per cent, as against little more than 18 per cent at the first of July. Car repairs, however, have decreased, amounting to 8.7 per cent at the beginning of November, as against 14 per cent in July.

Mr. Loree thought it not unlikely that transportation might again suffer a setback within the next few months, as a result of none too friendly relations between Mr. Stone and Mr. Lee, respective heads of the brotherhoods of engineers and trainman. This he believed especially true should it develop into a trainmens' strike. In the event of an engineers' strike, however, he thought the situation might prove less troublesome, as the job of an engineer in many respects has been made "fool proof" and could be filled, he believed, without difficulty.

Following the outbreak of the shopmens' strike this summer, Mr. Loree said, the Delaware & Hudson decided to strengthen its ranks by a plan to "out-union the unions." A fast company union was organized, with rituals. A graduated system of voting was put into effect, whereby an apprentice's vote counted one, a journeymen's two, a mechanic's four and a master mechanic's six. In addition a man was allowed an extra vote for every five years of service. This system of voting, he declared, was met with general approval.

What the railroad men desired most, Mr. Loree stated, was continuity of employment and a standard working day, and in some sections, these desires have been met as nearly as possible by the establishment of a schedule of eight and 10-hour days, according to the season.

Discusses Employment Relations

Speaking on "The Open Shop," John E. Edgerton, president of the National Association of Manufacturers, pointed out that the first essential in maintaining friendly relations between employer and employe was personal contract. He believed in frequent conferences. Of course, he added, it is a forgone conclusion that an employer must be fair and honest with his men, and that the employer in turn has the right to expect his men to believe in him. Speaking as a manufacturer, Mr. Edgerton declared he would rather have a machine stand idle for a year than have it operated by a man who did not believe in his honesty and principles. He urged manufacturers to take a more active interest in civic affairs. Employers by virtue of their work are organizers and leaders, and could be a tremendous force in placing citizenship on a better and higher plane. "If we fulfill all our obligations as citizens," Mr. Edgerton stated, "we will have little reason to complain."

Talks On Foundry Practice

D. R. Wilson, vice president of the Wilson Foundry & Machine Co., Pontiac, Mich., spoke on "Improved Foundry Practice," assisted by Henry Lane, engineer. William M. Taylor, of the Chandler & Taylor Co., Indianapolis, Ind., in an informal talk on the problem of "Apprenticeship," spoke of the action being taken by the educational boards in some states, in establishing standards of apprenticeship training. In New York state, he said, questionnaires have been issued, and he believed that in all likelihood laws will eventually be passed in various states defining codes which will be applicable to the various industries. He believes, however, that this problem can be met by the fixing of a rider exempting such industries as already have an established code from the necessity of accepting some new schedule which the state might impose and which might be unsatisfactory to the industry.

Administrative Council Chosen for 1922-1923

First District

H. B. Johnson, General Fire Extinguisher Co., Providence, R. I.
F. M. Weymouth, Hunt-Spiller Mfg. Corp., Boston.
Charles Berger, Eastern Malleable Iron Co., Naugatuck, Conn.
Robert E. Newcomb, Deane works, Worthington Pump & Machinery Corp., Holyoke, Mass.
Thomas Officer, Sullivan Machinery Co., Claremont, N. H.

Second District

James Eastwood, Benjamin Eastwood Co., Paterson, N. J.
W. H. Thomas, Straight-Line Engine Co., Syracuse, N. Y.
Walter S. Smith, E. W. Bliss Co., Brooklyn, N. Y.
J. T. Starkweather, Troy Foundry & Machine Co., Troy, N. Y.
J. E. McKelvey, American Wood Working Machinery Co., Rochester, N. Y.

Third District

Edward L. Langworthy, Adams & Westlake Co., Philadelphia.
F. B. McBrier, Erie Steam Shovel Co., Erie, Pa.
O. R. Read, Read Machinery Co., York, Pa.
Frank J. Epple, Trenton Malleable Iron Co., Trenton, N. J.
C. S. Koch, Fort Pitt Steel Casting Co., McKeesport, Pa.

Fourth District

Wm. M. Taylor, Chandler & Taylor Co., Indianapolis.
H. A. Becker, Lakey Foundry & Machine Co., Muskegon, Mich.
Neil C. Lamont, Laidlow works, Worthington Pump & Machinery Corp., Cincinnati.
William Greenbaum, Acme-Palmers & DeMooy Foundry Co., Cleveland.
S. W. Utley, Detroit Steel Casting Co., Detroit.

Fifth District

T. S. Hammond, Whiting Corp., Harvey, Ill.
Horace R. Culling, Carondelet Foundry Co., St. Louis.
C. E. White, Deere & Mansur Co., Moline, Ill.
H. E. Muchnic, Locomotive Finished Material Co., Atchison, Kans.
H. N. Strait, The H. N. Strait Mfg. Co., Kansas City.

Sixth District

Frederick L. Sivyer, Northwestern Malleable Iron Co., Milwaukee.
E. A. Peterson, Valley Iron Works, Appleton, Wis.
E. H. Neese, Beloit Iron Works, Beloit, Wis.
M. H. Pettit, J. I. Case Threshing Machine Co., Racine, Wis.
Frederic Crosby, American Hoist & Derrick Co., St. Paul.

Seventh District

W. M. Gartshore, McClary Mfg. Co., London, Ont.
A. R. Goldie, The Goldie & McCulloch Co., Ltd., Galt, Ont.

Eighth District

L. J. Black, Beaumont Iron Works Co., Beaumont, Tex.
Geo. M. Morrow Jr., Birmingham Machine & Foundry Co., Birmingham.
W. Henderson, W. K. Henderson Iron Works & Supply Co., Shreveport, La.
W. A. Griswold, Gray & Dudley Hardware Co., Nashville, Tenn.
W. D. Tynes, Hardie-Tynes Mfg. Co., Birmingham.

Honorary Member

O. P. Briggs, Minneapolis.

British Research Body Plans Foundry Advance

The first annual report issued by the Council of the British Cast Iron Research association states that 3000 foundries in the country are engaged in the production of gray or malleable cast iron, but of these only 202 have been induced to join the association. According to the report there can be no doubt that the lack of scientific investigaiton in the past has been largely instrumental in preventing the foundry industry counteracting the heavy encroachments being made into its trade by other competitive industries.

Acknowledgment was made for the valuable information furnished by the American National Research council in molding sands. A joint committee embodying members of the British association and members of the British Refractories association are arranging for a joint research on refractories affecting the cast iron and blast furnace industries. It is also proposed to carry on a research upon motor engine cylinder castings.

A special committee has been appointed to collect data with the view of establishing a uniform standard of production of malleable cast iron. Extensive investigations have been carried out in regard to shrinkage and similar matters. A lending library comprising 400 volumes has been established and progress has been made in the organization of a bureau of information.

Conference on Numbering of Steel Called

A conference to consider the desirability of providing a system of designating qualities or kinds of steel by code numbers has been called by the American Engineering Standards committee at the request of the United States bureau of standards. The conference will be held in the department of commerce building, Washington, D. C., Dec. 6. The subject of this conference is a matter of great importance to all manufacturers and users of steel in large quantities. An attempt will be made to determine the advisability of applying a uniform numbering system to forging steels, casting steels, structural steels including plates, tool steels and other steels not so classified. All of the organizations who would be affected by the change have been invited to send delegates to the conference.

Good Records Made

The production of open-hearth steel of the Youngstown Sheet & Tube Co. for the latter half of October broke all previous records and was at the rate of 85,000 tons per month. The actual total output of open hearth steel of the company for October was 75,008 tons. The average open hearth furnace activity in October was 11.2 furnaces out of 12. President James A. Campbell states steel production is being maintained in November at a rate per furnace equal to that of October but that it will be impossible to keep as many furnaces active. The blast furnace department of the company in October also established a new record for the four furnaces in operation, the output being more than 73,000 tons. A number of the pipe mills broke all records considered from the standpoint of sizes.

The Brier Hill Steel Co., Youngstown also produced in October in excess of 79,000 tons of steel from its 12-unit open hearth department, which it is believed has not been exceeded in such a period with similar capacity.

Foreign Competitors Are Selling in India

Consumption of iron and steel in India has not nearly regained its prewar volume and the potential market is large, according to advices received by the iron and steel division of the department of commerce. Although American products have an excellent name in several of the provinces, comparative prices with other countries have placed them at a disadvantage. Quality counts for little in the Calcutta market, importers customarily buying the cheapest goods. Foreign competition fortified by the high exchange value of the dollar has virtually eliminated American iron and steel from the markets of the Karachi district.

The American steel products imported into India in August were: 4 tons of beams, girders, etc., 108 tons of bolts and nuts, 5 tons of hoops and strips, five tons of nails, other than wire, 886 tons of cast pipes and fittings, 363 tons of galvanized sheets and plates, 1925 tons of tinplate, 1789 tons of sheets and plates not tinned or galvanized, 680 tons of wrought tubes, pipes, and fittings, 134 tons of wire nails, 9 tons of wire rope, 1492 tons of bars and channels. The bulk of the steel products imported came from the United Kingdom.

Monterey Plant Suspends

Monterey, Mex., Nov. 24.—In response to a telegram from Adolfo Prieto, general manager of Compania Fundicion de Fierro y Acero, known as the Monterey Iron & Steel Co., the plant of that company has suspended operations in most of its departments. In his telegram Mr. Prieto stated it would be impossible for the plant to continue full operation because of the financial crisis through which the country is passing. The suspension a few days ago of the Banco Francaise du Mexique, Mexico City, and its branch bank in Torreon, following on the heels of other banking troubles, has caused a financial flurry. This bank went into bankruptcy because if its inability to meet an obligation of 17,000,000 pesos, equivalent to $8,500,000 on demand.

Planning Large Expansion of Indian Works

The largest iron and steel interests in India, the Tata Iron & Steel Co., Takchi, is planning to enlarge capacity by the end of 1923 to an output of 650,000 tons of pig iron and 425,000 tons of finished steel annually, a large increase over the present capacity of approximately 300,000 tons of pig iron and 125,000 tons of finished steel according to reports received by the department of commerce.

The government has a small steel plant at Ichapere for the production of steel for ammunition and for government purposes but it is believed none of this product is for sale. The Bengal Iron Co. Ltd., is said to be producing more than 150,000 tons of pig iron annually. It is expected that an annual output of 180,000 tons of pig iron will be reached by the Indian Iron & Steel Co. when its new works being erected at Hirapur, Bengal, are completed. The proposition of erecting a modern steel plant with an output covering all basic steel products is being worked out, and a corporation for that purpose, the United Steel Corp. of Asia, Ltd., is in process of flotation. Several small companies have iron works under construction.

The Mysore government is putting up the money for the erection at Bhadravati, Shimoga district, Mysore, of iron works to have a capacity of 20,000 tons of charcoal pig iron. This plant is to utilize ore found all around the plant site in the Babadudin hills. It is to be known as the Mysore Distillation & Iron Works, and will be under the management of the Tata Iron & Steel Co.

Cement Products Increase

Washington, Nov. 28.—Value of the products of cement works in the United States in 1921 was $203,627,000, compared with $175,265,000 in 1919, states the census bureau. The cost of materials used in 1921 was $102,360,000 and in 1919 it was $79,510,000. The number of works was 125 in 1921 and 123 in 1919, the number of persons engaged 30,907 in 1921 and 30,247 in 1919, and the aggregate of salaries and wages $44,959,000 in 1921 and $42,691,000 in 1919.

Management

Problems Are Discussed at Meeting of Taylor Society—Officers Elected

At an exceptionally well-attended meeting of the Taylor society, held Nov. 22-24 at the Engineering societies building, New York, problems relating to management were discussed. Major attention was given to the problem of "Shaping Your Management to Meet Developing Industrial Conditions." H. S. Person, managing director of the Taylor society, submitted on this subject a paper full of sound advice to manufacturers who are endeavoring to meet changed market conditions.

With demand hesitant and a buyers' market likely for at least a decade, and perhaps permanently, said Mr. Person, the successful management of the future will devote its selling energy to convincing consumers of the quality of its particular sort of staple merchandise, rather than to an attempt to create in them new wants whose satisfaction would require the possession and expenditure of surplus dollars.

American business men, said Mr. Person, have been brought up in a sellers' market. This has resulted from the conditions peculiar to a new country with unexploited resources. Even before the war, however, there were signs that the end of this condition was approaching, he said, and the shock of war "seems to have hastened evolutionary tendencies and to have thrown us suddenly upon a buyers' market which will last for sometime and may be the beginning of a dominant buyers' market." One of the most conspicuous changes that will result from the changed conditions, in the opinion of Mr. Person, will be the supplanting of the "go-getter" type of executive by the thinking and planning type. The successful management in the future, he said, will give more attention to the study of long-run tendencies in business conditions. It will set up in writing plans for a considerable period ahead. Such a management, said Mr. Person, will have to conduct its selling operations with more skill than displayed before. It must adapt its advertising to changed conditions, keep a trained sales force and select discriminately its channels of distribution. Mr. Person said it should not be assumed that he attached less importance to better production methods. "If you can safely and consistently quote a lower price for an identical commodity and have a reasonably good selling organization, your competitors will hold you in dread."

Compilation of statistical data and its uses in connection with scientific management was discussed by several speakers. Harry B. Horwitz of the Joseph & Feiss Co., Cleveland, said that his company has a central clearing house for all data. Each department reports its data to the statistical division and, in turn, calls upon this division for whatever information it needs. Thus the departments are relieved of the burden of looking after these data. The cost of this system, said Mr. Horwitz, is about nine-tenths of 1 per cent of the total payroll. Floyd W. Woodcock, Day & Zimmerman, Philadelphia, discussed the advantages of compiling statistics in the operation and supervision of public utilities.

A session was devoted to discussing master budgets of sales and production and several speakers described the methods in use at their establishments. A session was devoted to discussing the subject of the supervision of personnel, the speakers representing principally rubber and oil companies. An interesting paper, describing the organization and management of the plant of the Corona Typewriter Co. at Groton, N. Y., was presented by Percy S. Brown, works manager for that company.

Richard A. Feiss, head of the Joseph & Feiss Co., Cleveland, was re-elected president of the Taylor society. Howard G. Coonley, president of the Walworth Mfg. Co., Boston, was elected vice president. Edward W. Clarke 3rd, Philadelphia, was re-elected treasurer. John H. Williams, Day & Zimmerman, Philadelphia, and Keppele Hall, Joseph & Feiss Co., Cleveland, were elected directors.

The Treadwell Engineering Co., Easton, Pa., manufacturer of rolling mill and steel works equipment is operating at 85 to 95 per cent of capacity.

Auto Output in October Shows Good Gain

Washington, Nov. 28.—Figures received by the department of commerce through the bureau of the census show a marked increase in the production of both passenger automobiles and trucks in October, compared with September. The total production of passenger cars in October was 217,098, compared with 137,126 in September, while truck production in October amounted to 21,416, as against only 18,656 in September. In October, 1921, production totaled only 134,734 passenger cars and 12,813 trucks.

The low figures for September this year were partly, although not entirely, accounted for by the closing of the Ford factories for a part of the month.

The following table gives the total production for each of the last four months, with corresponding figures for the same months of last year. With a few exceptions, the reports each month are from identical companies and include approximately 90 passenger-car and 80 truck manufacturers. October figures are subject to slight revision when all reports have been received.

PASSENGER CARS

	1922	1921
July	224,057	165,574
August	249,225	167,705
September	*187,128	144,669
October	217,098	134,734

TRUCKS

	1922	1921
July	21,357	10,766
August	24,200	13,080
September	*18,656	13,648
October	21,416	12,813

*Revised

Obituaries

JOHN J. Richardson, sales manager for the W. Bingham Co., Cleveland, wholesale hardware dealer, died Nov. 23 at his home in Cleveland. He came to Cleveland from Toledo 12 years ago.

Joseph DeVere, aged 52, secretary and general manager of the Ohio Elevator & Machine Co., Columbus, O., died Nov. 19 at Asheville, N. C., where he went two months ago.

Oscar Herbert Sherbrook, president of the Chauncey Thomas & Co., Inc., manufacturer of truck and automobile bodies, died at his home in Brookline, Mass., recently.

William M. Byers, prominently associated with the industries of Grananoque, Ont., died suddenly Nov. 18. He was principally interested in the Ontario Steel Products Co., the Grananoque Spring & Axle Co. and the Ontario Wheel Co.

Hedley P. Carter, vice persident and treasurer of the H. C. Cook Co., Ansonia, Conn., maker of sheet metal novelties, died at his home in that city, Nov. 19. He was 51 years of age, and had been connected with the company five years, previous to which he was with the Stanley Works, New Britain, Conn., for 16 years.

Charles Garland, treasurer of the Garland Mfg. Co., Pittsburgh, died Nov. 23 at Linesville, Pa. He was 53 years old. He was secretary of the Westinghouse Machine Co. for a number of years but since 1908 has been connected with the Garland company. He was a member of the Duquesne club and various other Pittsburgh organizations.

More Open Top Cars Released

Iron and Steel Shippers May Now Load in Any Direction Cars with Sides 48 Inches or Under, and All Others when Moving in Direction of Coal Mines—Fuel Regulations Modified—Fact Finders Organized

WASHINGTON, Nov. 28.—Improvement in the coal situation has been such as to warrant the interstate commerce commission in modifying its open top car order. The federal fuel distributor also is notifying bituminous coal operators they need not after Dec. 1 report daily loading, prices and destinations; but the efforts to remedy the basic conditions responsible for the strike and the consequent shortage are being continued.

The commission's order permits the loading of commodities other than coal in open top cars with sides over 48 inches in height. Heretofore, open top cars with sides over 42 inches could be loaded with commodities other than coal only when moving in the direction of the mines. This broadening of the order, which many believe is but the forerunner of its rescindment, was effective as of midnight Nov. 25. Estimates of the number of open top cars released vary from 16,000 to 35,000, with one as high as 52,000. As the commission's order now stands, the iron and steel industry may load in any direction cars with sides 48 inches or under, and all open top cars when proceeding in the direction of the mines.

When Distributor Spens took office on Sept. 22 it was with the understanding he would be released in 60 days, but he has agreed to remain until Jan. 1 at the request of the President. The expectation is then his work will be carried along by F. R. Wadleigh, coal expert of the department of commerce and for some time Mr. Spens' assistant.

The coal fact-finding commission created by congress in September has about completed the organization of its staff and is almost ready to send out its questionnaires. Statisticians of the federal trade commission and the National Coal association have assisted in their preparation. Coal trade papers and coal associations have loaned employes to the commission. The study of wages, contracts and earnings is to be directed by Prof. Joseph H. Willets of the Wharton School of Finance, Philadelphia. Commissioners Howell and Smith will personally oversee the study of engineering facts.

At a conference at the White House a few days ago Senator Borah, of Idaho, and Representative Winslow, of Massachusetts, proposed amendments to the act creating the commission, to provide more drastic punishment for violators, permit questionnaires to be submitted by coal companies other than in person and to insure the seating of Judge Samuel Alschuler, of Chicago. The latter must resign his post on the federal bench, which he is disinclined to do, or forego his work with the commission.

Lewis Is Obdurate

Recently, John L. Lewis, president of the United Mine Workers, declared that a wage reduction would not be accepted by the bituminous coal miners on April 1. This has been followed by the statement of Ellis Searles, editor of the miners' official organ, that bituminous miners will stand pat and anthracite miners will demand an increase. This is disquieting, in that the object of the fact-finding commission is to avert a coal strke in 1923 and at the same time propose a cure for some of the conditions necessitating continuation of wartime coal prices. Mr. Searles' threat is as follows:

"Whether there will be another strike of coal miners next year is a question that no living man can answer today. But I can say that the miners will not submit to any reduction in their wages, nor will they permit the coal operators to take away from them any of the conditions of their employment which they have won by many years of struggle, hardship and sacrifice. If there are any in this country who are anticipating lower wages for coal miners next year they may as well abandon that anticipation now and devote their spare time to some other subject.

"The miners are not asking for any general or universal increase in their wages in the bituminous industry, but miners in the anthracite region have asked, they are now asking and they will continue to demand increased wages until their wage rates are brought to the level where they belong and where justice to the mine worker and his family require that they shall be placed. For many, many years there has been a wide disparity between the wages of the anthracite miner and those in the bituminous industry and in comparison with the wages of men employed in other comparable industries and lines of work.

"Wages of anthracite mine workers always have been too low and they must be brought up to a decent American level. Next year will see miners of the anthracite region contending as valiantly and heroically for an improved wage scale as they have done heretofore, and they will continue so to contend until they obtain what is justly due them. And they will not abandon their striving for the universal 8-hour day in the anthracite industry."

The house interstate commerce committee now has two bills, both introduced by Representative Rogers, of Massachusetts, levying an embargo on exports of bituminous and anthracite coal for a period of six months.

Plans Large Extensions of Ashland Works

Important enlargements of the Ashland plant of the American Rolling Mill Co., Ashland, Ky., are in contemplation but the details of these extensions have not yet been announced. At the regular meeting of the board of directors of the American Rolling Mill Co., Middletown, O., recently George M. Verity, president of the American Rolling Mill Co., presented a statement regarding these extensions as follows:

"A plan covering the complete development of the new Ashland, Ky., plant of the American Rolling Mill Co. was agreed today at the meeting of the board of directors.

"The financial plan for that extension will be announced shortly, just as soon as a statement can be prepared for the stockholders. The company's plants have been running to full capacity all summer and a very satisfactory showing has been made."

One of the reports that has been in circulation with regard to the Ashland plant is that about 40 hot mills ultimately are to be added to the present plant of six sheet mills. The property of the Ashland Iron & Mining Co. was acquired by the American Rolling Mill Co. about a year ago. It consists of two blast furnaces, six open-hearth furnaces, a blooming mill and a sheet plant.

The Pyrene Mfg. Co., 520 Belmont avenue, Newark, N. J., is enlarging its plant facilities to enable it to do rust proofing work for other manufacturers.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

LORENZO C. DILKS, who has been prominently identified with the structural branch of the steel industry, has become vice president in Chicago of Starrett Brothers, Inc., which has been organized to carry on general building construction. For the present his office will be at 8 South Dearborn street. Mr. Dilks several months ago resigned as vice president of the George A. Fuller Co. During the war he was in charge of the Carolina Shipbuilding Corp., Wilmington, N. C., a George A. Fuller Co. enterprise. Prior to that time he was president of Milliken Brothers, Inc., Staten Island, N. Y., steel fabricators a post he accepted after serving the Eastern Steel Co., Pottsville, Pa., as general sales manager and in other executive capacities. In his earlier business years Mr. Dilks was connected with the organization of the American Bridge Co. Paul Starret fromerly president of the George A. Fuller Co. and the United States Realty & Improvement Co., is president of Starrett Brothers, Inc., which has its headquarters at 101 Park avenue, New York.

Herbert A. Stanton, assistant treasurer and credit manager of the Norton Co., Worcester, Mass., recently sailed for a two months European trip.

R. J. Frackleton, president of the Chandler & Price Co., Cleveland, has been elected a director of the Cleveland Trust Co.

R. F. Robinson has been placed in charge of the Seattle office of the Electrical Material Co., San Francisco, which was recently opened in the Hinckley building.

J. S. Langston has been made district manager of a new branch opened by the Witherow Steel Co., Pitsburgh, at 3-252 General Motors building, Detroit. L. A. Daines is his assistant.

J. Leo Scanlon has been appointed Buffalo representative for the Mahr Mfg. Co., Minneapolis, manufacturer of oil burning equipment, with offices at 950 Ellicott Square building, Buffalo.

William D. Martin, sales manager and purchasing agent of the Kenosha, Wis., works of the American Brass Co., a unit of the Anaconda Copper Co., has been promoted to the post of assistant general manager. He succeeds James R. Anderson, who resigned, to take effect Jan. 1. Mr. Martin went to Kenosha in 1910 from the Waterbury works in Connecticut.

George Macnoe, manager of the Boston office of W. B. Connor, Inc.,

LORENZO C. DILKS

New York, has been recalled to the home office to take charge of the contractors sales department, handling heating and pumping equipment.

Frank Kilmer, treasurer of the Wickwire Spencer Steel Corp.; Worcester, Mass., has tendered his resignation effective Feb. 1. It is understood he will be succeeded by a New York man.

A. R. Demory, president of the Timken-Detroit Axle Co., Detroit, has resigned as president and director of the company. He has been associated with the Timken interests for about 20 years.

L. E. Rohland, formerly connected with the Crucible Steel Co. of America, Pittsburgh, has been appointed special sales representative and demonstrator for the Poldi Steel Corp. of America, New York city. He will be located in the New York office. Mr. Rohland has had considerable experience in the handling and marketing of high grade steels.

James R. Anderson, assistant general manager of the American Brass Co., Kenosha, Wis., a branch of the Anaconda Copper Co., has tendered his resignation to the board of director, to take effect Jan. 1. He has been connected with the Kenosha plant nearly 20 years.

Wesley Lambert, metallurgical expert of J. Stone & Co., Deptford, London, nonferrous metal founders and alloy manufacturers, has arrived in the United States on a brief business trip. Among the products of J. Stone & Co. are large bronze propellers.

R. M. Lutz has been appointed the representative at San Francisco for the Northern Engineering Works, Detroit, and has opened offices at 507 Mission street. Mr. Lutz for 14 years was connected with the Cyclops Iron Works, San Francisco.

Chas. R. Hook, vice-president of the American Rolling Mill Co., Middletown, Ohio, accompanied by E. A. Emerson, export manager, and W. J. Beck, director of research, arrived in Great Britain recently on the MAURETANIA for a brief business trip through Great Britain and western Europe.

Chusuke Suyehiro, professor of metallurgy in the college of engineering at the Kyushu Imperial university of Fukuoka, Japan, has arrived at Pittsburgh to study processes of manufacturing steel. He was a former student in the Massachusetts Institute of Technology, Boston.

M. W. Hall, affiliated with the Jones & Laughlin Steel Co., Pittsburgh for some time, lately as chief mechanical engineer of its South Side plant, has resigned. He has been succeeded by C. J. Bigelow, formerly of the city office of the American Sheet & Tin Plate Co., Pittsburgh, who has been affiliated with the Jones & Laughlin organization for about six months.

William Whigham, vice president of the Carnegie Steel Co., has been appointed chairman of a subcommittee on waterways created by the Citizens' committee of Pittsburgh, on city planning. The purpose of the new committee is to determine Pittsburgh's requirements in the way of river terminals and trans-

portation facilities. Members of the committee will be named by Mr. Whigham.

A. B. Rathbone, of A. B. & J. Rathbone, Palmer, Mass., makers of wire, has returned from England.

John Wheeldon, general manager of the Wickwire Spencer Steel Corp., Worcester, Mass., has transferred his headquarters to the New York office.

R. W. Valls, vice president and consulting engineer of the Champion Engineering Co., Kenton, O., has resigned.

C. G. Bigelow has been appointed chief mechanical engineer of the Southside works of the Jones & Laughlin Steel Co., Pittsburgh. He succeeds M. W. Hall resigned.

Charles E. Scofield has been appointed New York district sales manager for the Wheeling Steel Products Co., succeeding N. J. Higinbotham, resigned.

J. J. Eichenberger, formerly associated with the freight department of the Pennsylvania railroad, has resigned to become traffic manager for the Pittsburgh Crucible Steel Co., Pittsburgh.

Stephen Badlam has been appointed works manager of the Superior Steel Corp., Pittsburgh, succeeding James Warren, who resigned to become works manager for the Lalance & Grosjean Mfg. Co., Woodhaven, L. I.

Clifford E. Paige, retiring general manager of the Worcester Gas Light Co., Worcester, Mass., has been elected a vice president of Charles H. Tenney & Co., Inc., Boston, engineers, with which he has been associated for about 20 years.

Roland A. Packard, mechanical engineer for the Ludlow Mfg. associates, Ludlow, Mass., accompanied by James Cormack, sailed from New York, Nov. 22, for Calcutta, India, where they will be connected with the associates branch plant.

J. C. Whitney has been appointed sales manager of the machine tool department of the Western Iron Stores Co., Milwaukee. William Strickler has been placed in charge of the company's engineering service and Leo Dumser in charge of cutting tool sales.

Frank Purnell formerly connected with the Youngstown Sheet & Tube Co., latter an assistant to J. Leonard Replogle in the steel division of the war industries board and recently vice president of the Consolidated Steel Corp., the export agency of various independent Steel companies has been elected vice president of the Bethlehem Steel Export Corp. Eugene G. Grace president of the Bethlehem Steel Co. is president of this corporation but it is understood Mr. Purnell will be active in the direction of its affairs.

L. Bradley who has been general superintendent of the Hadfield-Penfield Steel Co. of Bucyrus, O., for several years has resigned to become shop manager for the Galion Iron Works & Mfg. Co., Galion, O. Mr. Bradley's resignation will be effective in December.

John K. Boll for several years sales manager of the Page Steel & Wire Co., Pittsburgh and Monessen, Pa., has resigned to become affiliated with the Wheeling Steel Products Co., Wheeling, W. Va., in a sales capacity. This company will sell the output of the new rod and wire mills of the Whitaker-Glessner Co. now near completion at Portsmouth, O. Mr. Boll assumed his new duties recently.

T. C. Sherman, for the past several years assistant to the general sales manager of the Ludlum Steel Co., Watervliet, N. Y., has been transferred to Cleveland as district manager of sales, covering Ohio, Kentucky, and western Pennsylvania. His headquarters are in the Guardian building, Cleveland. W. M. Vrooman is now assistant to the general sales manager, P. A. E. Armstrong.

Paul Martyn Lincoln, consulting engineer and president of the Lincoln Electric Co., Cleveland, has been elected professor of electrical engineering and director of the school of electrical engineering at Cornell university. He succeeds the late Prof. Alexander Gray. Professor Lincoln is the author of several articles on electricity and recipient of the John Scott medal of the Franklin institute, Philadelphia, for work on the improvement of electrical apparatus. He is a graduate of Ohio State university.

William F. Anklan, who has succeeded J. F. Hartz as president of the Hall Lamp Co., Detroit and Kenosha, Wis., upon Mr. Hartz's election as chairman, started with the old Badger Brass Mfg. Co., Kenosha, as a bookkeeper 20 years ago. When the Hall company absorbed the Badger works, Mr. Anklan was sent to Detroit as office manager, later being elected secretary and treasurer. For several years he has been chief assistant to Mr. Hartz. With his election to the presidency, Mr. Anklan also assumes the general management of the business.

The Lima Locomotive works, Lima, O., is reported to have unfilled orders of about $14,000,000, equivalent to about eight months' capacity operations.

Handle Disputes Jointly

The British Empire Steel Corp., Toronto, is making an effort to bring about more harmonious relations between the men and the management and to provide a means for the peaceful settlement of disputes. A plan now under consideration proposes the organization of a general works committee of 38 members to be elected by the men, one from each important department. This committee will elect from among its members a small central committee of five or seven members. The company will appoint a management committee of about the same number which with the men's representatives will form a joint committee to which all disputes will be submitted.

To Study Waste

At the sixteenth annual convention of the Association of Life Insurance Presidents, to be held at the Hotel Astor, New York, Dec. 7, the general theme will be "Waste, the Chief Obstacle to Complete Business Recovery." This theme will be studied from various angles, including material waste, physical waste, mental waste, business waste, educational, political and governmental waste. Waste in human lives will be a featured subject. Insurance executives from nearly every state are expected to present reports measuring present national economic conditions and to consider ways and means to stimulate healthy business recovery.

May Standardize Threads

Washington, Nov. 28.—Standardization of oil well casing threads is to be discussed at a meeting in St. Louis, Dec. 6-8, attended by representatives of the American Petroleum institute and a subcommittee of the National Screw Thread commission on special threads. This subcommittee includes Maj. J. O. Johnson, of the gage section of the war department, who is chairman; Com. M. A. Libbey, of the navy department; and H. W. Bearce, of the bureau of standards, who is chairman of the screw thread commission.

Plan Operations by March 1

Youngstown, O., Nov. 28.—Construction of the six new mills of the Newton Steel Co., Newton Falls, O., is progressing rapidly and the plant management expects to be ready for operation by the end of February. The Newton Steel Co., is booked with orders for its full finished sheet products until the end of the year and as yet is not making contracts for 1923.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CONTRACT to design and supervise the construction of a pulverized coal preparation plant and convert hand-fired boilers for pulverized coal firing has been awarded the Fuller Engineering Co., Fullerton, Pa., by the Clark Thread Co., Newark, N. J. The pulverizing plant will have a capacity of 10 to 12 tons per hour. The coal will be dried in a 4-foot 6-inch x 30-foot indirect fired dryer using pulverized coal for fuel. The coal will be pulverized in two 46-inch mills, screen type, gear driven. The pulverized product will be conveyed from the mills to the boiler bins, a distance of 600 feet, by a Fuller-Kinyon type conveying system. This system will deliver the coal through a 5-inch line, distributing to the individual service bins through 10 two-way switching valves connecting the main line with branch lines. The conveying system will be equipped with electric-pneumatic control, by which the coal can be diverted from the main line through any of the switching valves by the operator in the coal house. The condition of the coal supply in each bin will be indicated by lights automatically operated on the switchboard in the coal house. The power plant will be equipped with 10 500-horsepower boilers, each one equipped with three pulverized coal feeders and three vertical flare type burners.

* * *

AUTOMOBILE springs are to be manufactured by the Barnes-Gibson-Raymond Inc. at Detroit. The company has been organized by the Raymond Mfg. Co., Corry, Pa.; Wallace Barnes Co., Bristol, Conn.; and the William D. Gibson Co., Chicago. Fuller F. Barnes has been named president; A. B. Peterson, treasurer; F. E. Whittlesey, secretary; and L. D. Adams, general manager. The company will be operated independently of the other three companies. It has purchased a factory building 80 x 199 feet at Miller and Abbey avenues, Detroit.

* * *

THE Birmingham Machine & Foundry Co., Birmingham, Ala., one of the largest plants of its kind in the South, has converted one of its departments into a soil pipe making plant. It is announced that during the early year an addition to the foundry will be erected for the sole purpose of manufacturing soil pipe by this company.

* * *

BOOKING of a sufficient volume of business to keep the capacity busy for some time to come has been responsible for reopening the Evered Foundry & Machine Co. plant at 116 Ogden avenue, Superior, Wis. The shop is taking orders and contracts for gray iron, semi-steel and brass castings, and patterns and machine work.

* * *

THE Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been awarded contracts for furnishing the electrical equipment for four harbor dredges being built by the Sun Shipbuilding Co., Chester, Pa. On these vessels, electricity will be used for every possible purpose. The main engines of each dredge will consist of three 1000-B horsepower Diesel engines, each of which will drive a 700-kilowatt Westinghouse generator.

* * *

THE Ingalls Iron Works, Birmingham, Ala., is constructing 30 10-ton steel containers for the Munson line of steamships, to be used on boats plying between New York and southern ports. These containers will expedite the handling of freight on the Warrior river, in Alabama, through the port of Mobile, and on the Mississippi river, through New Orleans. The Ingalls company built a number of these steel containers for the government's Warrior river barge line and the service is to be taken up on the large steamship lines.

* * *

WORK was resumed Nov. 22 at the Duquesne Steel Foundry Co's plant at Kendall Station, near Coraopolis, Pa., which was damaged by a fire Nov. 20. Three buildings of the plant covering 20 acres along the Ohio river were damaged. D. W. Wakefield, president of the company, after a checkup of the damage, said it will be upward of $100,000. The fire started under the floor of the pattern shop and the flames damaged only the main foundry building. Work will be started shortly in rebuilding the three shops.

* * *

SPACE and facilities for the business of Harry B. Davis, which has been incorporated as the H. B. Davis Iron & Steel Co., Portland, Oreg., have been increased by the completion of a new warehouse. The new buildings are equipped with cranes and carry a line of steel products, consisting of bars, plates, sheets, angles, channels, beams, shafting, etc. The office of the company is at 390 Front street. It formerly was at 389 Water street. The warehouses are at 388 Front street and at Hood and Grant streets.

* * *

THE reorganized Western Iron Stores Co., Milwaukee, John A. Camm president and general manager, opened display and sales rooms at West Water and Sycamore streets, Nov. 25. Mr. Camm retired Sept. 1 as sales manager of the Kearney & Trecker Corp., Milwaukee. The Western Iron Stores Co. handles Rockford milling machines, Monarch lathes, Whipp shapers, Hoefer drills, Wilmarth Morman grinders, Bridgeport automatics, Dauber-Kratsch tools, Fitchburg and Bath Universal grinders, and Barber-Colman gear hobbers. The company also carries a full line of transmission supplies, mill supplies and mechanics' tools, belting, hoists, etc.

* * *

MENOMONEE FALLS, Wis., near Milwaukee, has been selected as the seat of the permanent plant to be erected at once by the J. L. Austin Mfg. Co., Milwaukee, established about two years ago to manufacture portable and stationary tool grinding machines and other similar mechanical devices. The company is capitalized at $50,000 and its president and general manager is J. L. Austin, formerly with the Luther Grinder Co., Milwaukee. C. A. Reuter, formerly production man of the T. L. Smith Co., concrete mixers, is secretary and treasurer. The works manager is A. Waecker, until recently with the Chain Belt Co. The present offices and shop are at 419-423 Van Buren street, Milwaukee.

Survey Shows Heavy Tax Burden on Industry

Expansion of industry and development of the country are imperiled by present taxation conditions according to the National Industrial Conference board, which has just completed a comprehensive study of the growth of public expenditures and taxes in six leading nations of the world. The tax bill of the United States is fast making inroads upon the surplus necessary for economic progress and threatens materially to hamper the nation's growth, especially in view of the rise in local government taxes, says the board. A reduction in and wider diffusion of the national tax burden is suggested.

The main findings of the investigation, as set forth in the report entitled "Taxation and National Income" are as follows:

From 1903 to 1914 the total expenditures of all public disbursing authorities in the United States increased from $22 to $35 per capita; in the United Kingdom from $40 to $42 per capita; in France from $24 to $33; in Italy from $14 to $22; in Germany from $44 to $69 and in Japan from $5 to $8 per capita.

From 1903 to 1913 the per capita taxation of national, state, provincial and local governments rose from $18 to $23 in the United States, from $24 to $27 in the United Kingdom, from $17 to $22 in France, from $10 to $12 in Italy, from $12 to $19 in Germany, and from $3 to $6 in Japan. The percentage increase during the 10-year period was largest for Japan (95 per cent), and lowest for the United Kingdom (15 per cent). Germany showed an increase of 62 per cent, France 36 per cent, the United States 31 per cent and Italy 27 per cent. At present, of the six countries studied, the United Kingdom ranks first in tax burdens per capita, with the United States following close behind, Germany third, France, fourth, Italy fifth and Japan last.

In the United States federal taxes totaled $4926 millions in 1919; in 1921 they amounted to $4430 millions, a decline of 11.2 per cent. The 1921 dollar, however, had a purchasing power of 26.9 per cent more than the 1919 dollar and hence the federal tax burden in 1921 was actually 15 per cent higher in the aggregate than in 1919.

Comparing the total per capita tax burden on the prewar internal purchasing power basis with the prewar national income for each of the six countries studied, it is found that in the fiscal year 1920-1921 about 1/6 of the prewar national income of the United States was diverted into tax channels; 1/5 in the United Kingdom; 1/12 in France (1/8 in the calendar year of 1921); 1/16 in Italy; 1/8 in Germany and slightly less than 1/5 in Japan.

In the fiscal year 1913-1914, taxes paid to national, state and local governments in the United States represented 6.4 per cent of the national income. By 1919-1920 the ratio had grown to 13 per cent, and by 1920-1921 to 14.3 per cent. In the calendar year 1921, 1/6 of the current national income was diverted into tax channels for the support of governmental bodies in the United States.

Per capita tax burdens in the United States in 1919 were highest in New York State ($148.36), followed by Massachusetts ($125.35), Delaware ($124.41), Rhode Island ($115.25), and Michigan ($105.71), the lowest per capita tax being in Alabama, ($26.47).

Syndicate Acquires Plant of Sweet's Steel Co.

A syndicate headed by Joseph Kaye and Daniel F. Swartz has exercised an option to purchase 90 per cent of the stock of the Sweet's Steel Co., Williamsport, Pa. The purchase was made from the estate of R. L. Ahles and allied interests. The amount involved was about $1,500,000. Sweet's Steel Co. was organized in 1859 at Syracuse, N. Y. by the late William A. Sweet to manufacture special shapes. Later the company developed the rerolling of rails into angle bars, springs, etc. In 1904 the plant was moved to Williamsport, Pa. Control was obtained in 1907 by a syndicate headed by R. L. Ahles and others.

The company embarked in a comparatively new business in 1910 when it started the re-rolling of light steel rails from worn-out and discarded steel rails. The present capacity of the plant is 60,000 tons of light rails and 40,000 tons of merchant bars and light structural shapes.

Among those included in the syndicate in addition to Mr. Kaye and Mr. Swartz are: James B. Bailey, president of the Pine Iron Works Co., Pottstown; John M. Young, president Sweet's Steel Co.; L. E. Kipe, sales manager, Philadelphia district; J. H. Finch, sales agent, New York district; W. L. Richards, sales agent, Wilkes-Barre district; R. K. Cheney, general superintendent; Frank J. McGrath, superintendent of works; Charles C. Steel, general sales manager, and John E. Spotts, purchasing agent of the company. Officers under the new organization probably will be:

Chairman, Mr. Kaye; president, Mr. Young; vice president, Allen P. Perley; treasurer, Mr. Swartz; secretary and general counsel, Clarence L. Peaslee. The present directors of the company are: Mr. Young, Gen. William C. Heppenheimer, president Trust Company of New Jersey, Jersey City, N. J.; W. L. Wright, president of the Savage Arms Corp., New York; Allen P. Perley, president of the West Branch National bank, Williamsport, and Mr. Swartz. It is understood that the board will be increased by the election of Mr. Kaye, William P. Beeber and Mr. Peaslee.

Cromwell Steel Co. Will Make Seamless Tubes

Title of the Cromwell Steel Co., Lorain, O., which was bid in by bondholders for $1,100,000 at auction last week, will pass to the Midland Seamless Tube Co. a new holding company just organized by the bondholders with a nominal capital of $10,000. W. E. Guerin, vice president of the Guardian Savings & Trust Co., Cleveland, representing the bondholders presented the only bid at the sale. The property of the Cromwell company was appraised at $1,600,000.

The new owners of the company are planning additions and expansions which will permit of the manufacture of seamless tubing. The Cromwell Steel Co., was organized in 1916. It was active during the period when war material was in demand. The plant has been closed for two years. It includes four 90-ton open-hearth furnaces, a 20-ton steam hammer, and a two-stand 30-inch bar mill. The annual capacity is 200,000 tons of ingots.

Plans for the reorganization and operation of the property are still in the formative stage. It is believed, however, that Mr. Guerin, and C. A. Orr, and others of the creditors' committee of the company will be identified as officers and directors. Mr. Orr was formerly vice president and general manager of the company and was named receiver last January upon application of the Guardian Savings & Trust Co.

To Readjust Capital of Reed-Prentice Co.

The Reed-Prentice Co., Worcester, Mass., is to readjust its capital stock as a result of the taking over of the Becker Milling Machine Co., Hyde Park, Mass., and the Whitcomb-Blaisdell Machine Tool Co., Worcester. The new authorized capital will consist of 16,000 shares of common stock without par value and 12,500 shares of preferred stock of a par value of $100 each. The milling machine business will not be operated as a separate manufacturing department in the Reed plant, but lathes and other machinery will be built in the Prentice plant. Scott F. Taylor, superintendent of the Becker plant, will be superintendent of the Reed plant; A. S. Morse will be in charge of sales for the small tool department; L. D. Farmer will be mechanical engineer; Charles Brown, production engineer, and L. S. Cook, correspondence clerk. The Whitcomb-Blaisdell plant is being dismantled and the equipment in this as well as in the Becker plant not needed by the Reed-Prentice Co., is being offered for sale.

Light Demand

Prevails for Fire Clay and Silica Brick —Magnesite Brick Unchanged

Pittsburgh, Nov. 28.—Due to the fact that fire clay and silica brick users took advantage of the dull period in September to make repairs, relinings, etc., brickmakers now notice a falling off in demand. A few large companies, however, report that customers are purchasing at a normal rate although considerable difficulty is encountered in obtaining sufficient cars for shipment. The car supply is somewhat easier than two or three weeks ago. Production for and shipment against old orders continues fairly high; in fire clay being approximately 70 and 75 per cent, respectively, while in silica, production and shipments are maintained on the basis of about 55 and 45 per cent, respectively. Shipments of brick are being made upon orders for three or four large installations, including the Clairton, Pa., by-product coke plant, the Weirton, W. Va., by-product coke plant and the Wisconsin Steel Co.'s new plant at Chicago, while shipments for the Otis Steel Co., Cleveland, are due to start this week. Fairly sizable orders for brick for sheet mill furnace installations are current. Recent orders for fire clay and silica have been relatively small but prices are holding firmly in fire clay although in connection with Pennsylvania silica some few concessions have been made. A few recent orders have been taken at below $45 and for the time being the market is considered quotable at $43 to $45. Some orders have been taken at Chicago in advance of $50, by $2 per 1000, and at Birmingham the minimum is $48, while as high as $50 has been obtained in one or two cases.

Magnesite brick continues unchanged at $70 per net ton, seaboard base. Demand is limited, only a few small sales and inquiries being recorded in the past two weeks. The firmness of chrome brick at $50 is confirmed by the recent placing of a large number of orders involving from 6000 to 50,000 brick at a time on that basis. One interest reports aggregate orders in excess of 100,000 brick in the past week or so. Due to the scarcity of chrome ore, the high cost of labor, etc., an advance may be inaugurated shortly. The use of chrome brick in soaking pits as well as in open-hearth furnaces is noted.

Refractories

FIRE CLAY BRICK

(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	38.00 to 41.00
Ohio, No. 1	41.00 to 43.00
Ohio, No. 2	39.00 to 41.00
Illinois, No. 1	43.00 to 46.00
Illinois, No. 2	40.00 to 42.00
Kentucky, No. 1	41.00 to 43.00
Kentucky, No. 2	39.00 to 41.00
Missouri, No. 1	38.00
Missouri, high grade	48.00
Maryland, No. 1	45.00 to 48.00
Maryland, No. 2	35.00 to 42.00

SILICA BRICK

Pennsylvania	$43.00 to 45.00
Chicago	50.00 to 52.00
Birmingham	48.00 to 50.00

MAGNESITE BRICK

(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$70.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	$50.00

Will Not Reopen Suit

Washington, Nov. 28.—Reopening of the dissolution suit against the International Harvester Co. will not be sought by the department of justice unless the company violates the consent decree of 1918, which was modified in 1920, or gives rise to a new cause of action, Assistant Attorney General Goff has informed the senate. This statement was prompted by the recommendation of the federal trade commission in May, 1920, that the components of the International Harvester Co. be further unscrambled and the Wisconsin Steel Co. be disposed of. The department of justice holds that it is bound by the decree just as well as the defendants, and that the claim of the trade commission that the consent decree was improvidently negotiated gives no basis for action at this time.

May Unite Plant

Consolidation of the Aetna Foundry & Machine Co. of Warren, O., and the Youngstown Foundry & Machine Co., Youngstown, will be the probable result when stockholders of the latter company will meet in special session Dec. 23 to discuss a proposal to sell their properties to the Aetna Company. Both companies are engaged in the building of general steel works equipment and together own three plants, two in Youngstown and one in Warren. If the transaction is consummated a new corporation with a capital of about $1,000,000 will be organized. Myrin I. Arms II. is head of the Aetna company and W. J. Wallis is president of the Youngstown Foundry Company.

Iron Product Gains

Net earnings of the Iron Products Corp., New York, a holding company of iron, coal and foundry interests, for October amounted to $160,000 before taxes, against $135,000 in September. The company reports that on some of its important lines, bookings assure full operation through May of 1920.

Prices Unchanged

On Coke By-Products—Toluol and Solvent Naphtha Are Scarce

New York, Nov. 28.—Due largely to the substantial amount of production going into 90 per cent benzol, toluol and solvent naphtha are scarce. This scarcity is further emphasized by difficulty in making shipments. Production of light oil distillates generally, however, continues to improve.

Prices are unchanged at 30 cents ovens, in tanks and 35 cents in drums; 90 per cent benzol, 27 cents in tanks and 33 cents in drums; toluol 30 cents in tanks, and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; commercial xylol, 26 cents in tanks and 34 cents in drums; and pure xylol, 30 cents in tanks and 35 cents in drums.

Contracting in naphthalene for next spring's shipment continues in good volume, with the market at 6 to 7 cents per pound, f.o.b. producers' works, for flakes, and 7 to 8 cents for balls. Phenol is holding nominally at 22½ cents, producers' plants.

Sulphate of ammonia is in only fair demand, with inquiries coming principally from the South. Foreign inquiry also is rather light. Prices are steady at $3 to $3.05, works, on domestic business, and nominally $3.55 to $3.60 port, in double bags on foreign.

Coke Oven By-Products

		Spot
Per Gallon at Producers' Plants in Tank Lots		
Pure benzol	(nominal)	$0.30
Toluol	(nominal)	0.30
Solvent naphtha	(nominal)	0.27
Commercial xylol	(nominal)	0.29
Per Pound at Producers' Plants		
Phenol	(nominal)	$0.22½
Naphthalene, flake		0.06 to 0.07
Naphthalene, balls		0.07 to 0.08
Per 100 Pounds at Producers' Plants		
Sulphate of ammonia		$3.00 to $3.05
Contract		
Pure benzol		$0.30
Toluol		0.30
Solvent naphtha		0.27
Commercial xylol		0.29
Per Pound at Producers' Plants		
Phenol	(nominal)	$0.22½
Naphthalene, flake		0.06 to 0.07
Naphthalene, balls		0.07 to 0.08
Per 100 Pounds at Producers' Plants		
Sulphate of ammonia (12 months)		$3.00 to $3.05

The Farrel Foundry & Machine Co., Ansonia, Conn., will redeem on Dec. 15 its March, 1920 issue of $1,200,000 of cumulative preferred stock at $106.75. The par value is $100 a share and the redemption value $105, in addition to which there is an accrued dividend of $1.75 a share.

Single Tool Orders Predominate

Equipment Buying Is Scattered but Orders Are Fairly Numerous—Prospective Demand of Size Looms—More Tool Price Advances Scheduled for Dec. 1.—Large Coal-Handling Machinery Order Placed

INDICATIVE of present machine tool demand is the report of a Chicago machinery dealer on orders which it has received during the past 10 days. The report shows that during that time 15 tools were disposed of to 13 buyers, indicating that equipment buying still is of the single tool variety representing absolute needs of users.

Railroad buying, while not large, still is a feature of the market. Buyers of this class during the past week included the Pennsylvania, Pittsburgh & Lake Erie, Missouri, Kansas & Texas, Chicago, Burlington & Quincy and the Keith Railway Equipment Co. Early action is expected on pending lists from the Pennsylvania, the Chicago, Burlington & Quincy and the Chicago, Milwaukee & St. Paul.

Sales to general industrial users are numerous, but are scattered. The Donahue Steel Products Co. reports the sale of 15 tools to 13 buyers. The Nash Motor Co., Studebaker Corp., International Harvester and the General Electric Co. continue actively in the market. Prospective demand is large. Buying is expected soon against the list of equipment for the Gary tube mill project. Another prospective buyer is the Ohio Seamless Tube Co., Shelby, O., which is said to be planning plant additions and the purchase of additional equipment at a cost of $200,000. Dealers are showing interest in machinery auctions. One, involving 90 machines and 26 cranes will be held Dec. 4 and 5 at Bradford, Pa. Effective Dec. 1 Warner & Swasey turret lathes are advanced 10 per cent, as are those of the Boye & Emmes Co., the Walcott Lathe Co., and the Foster Machine Co. The E. W. Bliss Co. on Dec. 1 will advance prices from five to 20 per cent.

One of the largest orders for coal handling machinery noted in some time was placed last week with the Alliance Machine Co. by the Virginian railroad. The equipment will cost in the neighborhood of $1,250,000. In general crane demand is unsatisfactory.

General Equipment Demand Is Scattered

NEW YORK, Nov. 28.—Sluggishness continues to characterize business in the eastern machine tool market. Industrial demand is small and scattered, and railroad activity is being confined almost entirely to some relatively small buying by the Pennsylvania railroad, including the purchase of 15 grinders. One eastern manufacturer reports the sale of some equipment to central western railroads, including a 90-inch driving wheel lathe for the Pittsburgh & Lake Erie and a 72-inch duplex control horizontal borer for the Missouri, Kansas & Texas. The Pennsylvania railroad is expected to buy.

By far the outstanding order in the conveying equipment market is that of the Virginian railroad, involving $1,250,000 of coal handling machinery for its terminal under construction at Norfolk, Va. The contract went to the Alliance Machine Co., Alliance, O. While a few new crane inquiries are out and a few orders are being placed, demand is dull.

Tool Prices on Higher Level

CHICAGO, Nov. 28.—The Chicago, Burlington & Quincy railroad will place orders on its long standing inquiry by Dec. 1, the purchasing department having

Crane Awards and Inquiries of the Week

Orders Placed

One 4-motor electric traveling bucket crane with 86-foot span for the Ohio Marble Co., Piqua, O., to the Northern Engineering Works, Detroit.

One 3-motor electric traveling crane with 25-foot span and one 1-motor, 10-ton crane with 40-foot span, both for the New Orleans Railway & Electric Light Co., New Orleans, to the Northern Engineering Works, Detroit.

One 50-ton, 4-motor electric traveling crane with 52-foot span for the J. A. P. Cressfield Contracting Co., Philadelphia, to the Northern Engineering Works, Detroit.

One 40-ton electric crane, 54-foot span, for United Gas & Electric Corp., 61 Broadway, New York, to Milwaukee Electric Crane & Mfg. Co.

One pile driver for the Truxillo railroad, a subsidiary of the United Fruit Co., New York, to Industrial Works.

One 40-ton locomotive crane for Dwight P. Robinson & Co., New York, to Industrial Works.

One 50-ton electric crane for United Gas Improvement Corp., Philadelphia, for installation at Devon, Conn., reported placed.

Approximately $1,250,000 of mechanical equipment for coal pier for Virginian railroad, Norfolk, to Alliance Machine Co.

One 3-ton electric crane for Dwight P. Robinson & Co., New York, to Milwaukee Electric Crane & Mfg. Co.

One 6-ton grab-bucket crane for the American Construction & Securities Co., erecting a power plant at Williamsport, Md., to Milwaukee Electric Crane & Mfg. Co.

One 5-ton crane for the Duquesne Light Co., awarded to the Pittsburgh Crane & Equipment Co., Pittsburgh.

One 10-ton 3-motor crane with 50-foot span for the Duquesne Steel Foundry Co., Coraopolis, Pa., to the Pittsburgh Crane & Equipment Co., Pittsburgh.

Two transmission cranes and one 3-ton hoist for the Neely Nut & Bolt Co., Pittsburgh, to the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

Orders Pending

Three 125-ton ladle cranes for Carnegie Steel Co., Duquesne, Pa., bids being taken.

One each 10-ton and 15-ton pneumatic cranes and one 5-ton 3-motor crane for installation at Clairton, Pa., by-product plant, and one crane for the Weirton, W. Va., by-product plant; to be taken by the Koppers Co., action deferred until this week.

One 10-ton crane; specifications changed from 75 to 70-foot span for the Blaw-Knox Co., Pittsburgh; new bids being taken for prompt delivery.

Cranes for the Michigan Steel Corp., First National Bank building, Detroit; definite inquiry to be issued later.

One each 3-ton and 5-ton cranes for the Pittsburgh Screw & Bolt Co., Pittsburgh; bids being taken.

One 10-ton crane for the Pittsburgh Knife & Forge Co., Coraopolis, Pa.; bids all in.

One 10-ton crane for the Cutler Steel Co., New Cumberland, W. Va.; bids all in.

One 7½-ton crane for the Universal Steel Co., Bridgeville, Pa.; bids all in.

One 10-ton and 10 jib cranes for the Pennsylvania railroad, Freedom, Pa.; action expected soon.

One ladle crane for Heyl & Patterson, Inc., Pittsburgh, for installation in central Ohio, for pig casting purposes.

received orders to proceed at once to close this business.

Several increases in quotations have been announced recently. Warner & Swasey will advance turret lathes 10 per cent Dec. 1 and the Foster Machinery Co. has announced a similar advance. Prices on this line declined more rapidly than other tools, the present increase being a natural readjustment. The Boye & Emmes Co. has announced an advance of 10 per cent in quotations on its lathes. Refrigerating equipment makers are furnishing some orders for tool equipment. The Chicago, Milwaukee & St. Paul railroad is expecting to close shortly on a number of secondhand machines. The Nash Motors Co. has placed orders for about a dozen automatic screw machines and the International Harvester Co. and the Studebaker Corp. have bought several pieces of equipment from the same maker.

Within the past 10 days Donahue Steel Products Co., Inc., Chicago, machinery dealer, reports a fair total of orders. These include one guillotine shear to Hubbard & Co., Pittsburgh., one hammer, a punch and shear and a bulldozer to the Ulrich Mfg. Co., Rock Falls, Ill.; one 2-spindle threading machine and one single-spindle threading machine to the North American Car Co., Chicago; one punch and shear to the Central Frog & Switch Co., Cincinnati; a punch and shear and a power hammer to the Bemis Car Truck Co., Springfield, Mass.; one hot saw and burring machine to B. J. Coghlin Co., Montreal, Que.; a single-spindle threading machine to the Acme Steel Goods Co., Chicago; a single-spindle threading machine to the United Boiler Heating & Foundry Co., Hammond, Ind.; one punch and shear to the Lally Column Co., Chicago; one 2-spindle threading machine to the Keith Railway Equipment Co., Hammond, Ind., and one upsetting and forging machine to the Chicago, Burlington & Quincy railroad. These orders indicate clearly the present extent of buying.

Tool Inquiry Is Plentiful

PITTSBURGH, Nov. 28.—Plentiful inquiry and intermittent buying features the machine tool and equipment field. Numerous propositions are up for prices but buying action continues to be deferred. In connection with some of these, orders doubtless will be placed shortly after the first of the year. The two largest propositions now before the trade are the list involving 75 or 100 items for the Pennsylvania railroad for its machine shop at Altoona, Pa., and the list issued late in October of 14 or 15 additional machines required for the Gary, Ind., tube mill, which list has been augmented the past week by an additional inquiry for six tools. Buying commences on the former list this week and in addition to orders placed in the East, a Pittsburgh dealer, the Brown & Zortman Machinery Co., received an order for four 5-foot radial drills and a forging machine. Buying against the Gary list is expected to develop within two or three weeks. Some inquirers seek prices on equipment to be shipped after Jan. 1. A variety of orders are being placed involving new and used machinery. One dealer reports the sale of an open side planer for Fairmont, W. Va.; a large slotter, a milling machine, a large saw and an 18-inch lathe. These tools were secondhand. He also disposed of a new shaper and a new riveting hammer. A local manufacturer closed on a large heat treating furnace involving the outlay of approximately $3000. A small foundry type blower was sold to a user in the Pittsburgh district while another closed on a motor-driven squaring shear. Another order called for two small drills, while three used machinery deals are in progress, one for Pittsburgh and the other two for York and Erie, Pa., respectively, on which verbal orders have been given. Inquiries are numerous for single machines and two large punching and shearing jobs may go through this year. A punch press and a 20-inch x 10-foot lathe are involved in one current inquiry while another calls for a punch press and a shaper. Prices continue to advance, the latest increase being one of 10 per cent on Nov. 15 in connection with Walcott lathes. Bliss prices are scheduled to advance five to 20 per cent Dec. 1.

Molding machine purchases are the feature of the foundry equipment market, several large orders having been placed recently. The Chickasaw Shipbuilding & Car Mfg. Co., Birmingham, placed the largest order received recently by the Herman Pneumatic Machine Co., Zelienople, Pa. This covered six jarring and seven large rollover machines. The American Radiator Co., Buffalo, and the American Locomotive Co., Richmond, Va., each bought two of the last named machines; the Advance Boiler Corp., Poughkeepsie, N. Y., also purchased two, together with one jar stripping plate machine. The Josiah Anstice Co., Rochester, N. Y., closed on one of the rollover type as did the Hunt-Spiller Mfg. Corp., Boston. Several more confirming orders are on the way for verbal orders already given. Sellers of general foundry equipment note a fair demand for sand mixers, sand cutters, and other sand machinery. A local foundry interest is about to close on a cupola; another wants a tumbling barrel. Intermittent purchases of ladles, wheelbarrows, flasks and riddles are noted, together with a fair quantity of smaller foundry supplies. Several new inquiries are out for this type of equipment, small ladles being particularly active. Core oven demand is fair.

Equipment Demand Is Unchanged

CLEVELAND, Nov. 28.—Demand for machinery and shop equipment in this district continues much the same as that of a week ago. In fact, there has been practically no change, either for better or worse, and dealers continue to report a somewhat restricted demand for single tools. By far the largest amount of the business being placed is for secondhand machinery although demand for new tools is heavier than was formerly the case. So far as can be learned no outstanding sales have been made by dealers within the past week. Nor have any inquiries of size come out.

Interest in machinery and equipment auctions continues to be shown by dealers in secondhand tools. One such auction, scheduled for Dec. 4 and 5 is expected to attract a large number of buyers. This auction is that of the plant and machinery of the United States & Cuban Allied Engineering Corp., Bradford, Pa. Included in the equipment to be offered are seven planers, 49 lathes, four milling machines, nine drill presses, three horizontal boring mills, two hydraulic presses, two shapers, 12 grinders and considerable woodworking machinery as well as 20 electric traveling cranes and six hand-traveling cranes.

While the majority of the inquiries in the market are for single tools, there are a number of new projects being developed and it is expected these will furnish a large machine tool demand during the early part of 1923. One of the latest projects to come before tool dealers is the proposal of the Ohio Seamless Tube Co., Shelby, O., to enlarge its plant and purchase additional machinery and equipment at an estimated cost of $200,000.

Sales Are Being Maintained

TORONTO, Ont., Nov. 28.—Sales of machinery are holding to the average of last month and dealers and builders report a good volume of business. Inquiries from automobile manufacturers, railways, pulp and paper manufacturers and lumber companies are numerous and sales to these interests are improving. Mining interests of northern Ontario, the Maritime provinces and British Columbia are entering the market for equipment for new

plants. Small tools are moving in a brisk manner and dealers have orders on their books for delivery of these lines running into next year.

The Canadian Allis-Chalmers, Ltd., 212 King street west, Toronto, Ont., has the contract to supply an electric-driven pump for Port Perry, Ont. The Dominion Engineering Works, Ltd., Montreal, Que., has a contract to furnish pumping equipment for the Sumas reclamation project in British Columbia. The Ford Motor Co. of Canada, will let contracts in connection with a proposed new plant at Ford, Ont., which will cost in the neighborhood of $6,000,000. A notable change in the works is being made at present by the conversion of the 2200 machines from belt to direct motor drive. Direct motor drives will be installed throughout the plant and it is understood that the Westinghouse company has the contract for this work. Equipment for the entire plant will represent a large investment in machine tools, but dealers do not look for contracts for the entire works to be placed before next spring. The Thompson Motor Supplies, Ltd., 415 Queen street west, Toronto, Ont., will erect a factory. The Electropax Mfg. Co., Mount Dennis, Ont., will rebuild its plant recently damaged by fire, and will install equipment for the manufacture of electrical supplies, etc.

Buyers Inclined to Wait

BOSTON, Nov. 28.—New England demand for machine tools continues quiet. However, manufacturers in this district report the national demand improving and inquiry points to large buying in 1923. Dealers report the number of quotations out unusually heavy for this time of year, and if but a modest proportion of these develop into orders, trading will be above the average. One manufacturer reports November sales showing a better total than for the same period in many months.

New England industries show positive improvement in many lines, and sales of tools during the past week have been to hardware manufacturers, textile machinery manufacturers, jewelry plants, and to scattered general shops. The General Electric Co. at Lynn, Mass., continues to pick up four or five tools each week. It now has a list out asking for lathes and planers. A Massachusetts valve manufacturer bought four tools and is in the market for as many more. A Waltham machine shop and foundry has gone out of business, and is selling its complete line of machine tools. Among other items the Hood Rubber Co. bought five or six lathes. Boston dealers generally report a slight falling off in sales during the past week and a tendency on the part of the larger buyers to wait until after the first of the year. A western New England plant bought a 15-ton industrial crane and new crane inquiry is reported by one dealer. At least four traveling cranes have been up for figures and are expected to be placed either in December or early January.

Prospective Demand Encourages Dealers

MILWAUKEE, Nov. 28.—So far as can be determined the volume of sales in November, both at the source and through agencies, comes closer to the October mark than had been expected. It looks as if December is going to produce a better quality and quantity of business than the month now ending, but sellers are pinning their hopes on demand during January, February and March. This expected demand is based on pending inquiry. Makers of milling machines are sure of keeping present forces intact until Dec. 31 by orders now on books. The amount of railroad buying in this market has been disappointing. General business continues to come in single tool orders, with here and there a purchase of two or three machines. No large lots have been placed and none seems to be in sight. In a general way, business is as good as might be expected under existing conditions.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

FAIRFIELD, CONN.—The S. Lowe & Sons Co., manufacturer of builders' hardware, has awarded a contract to Thomas Lanese for a 2-story addition, 45 x 80 feet.

NEW HAVEN, CONN.—The Holmes Special Tool Co., 38 Canal street, has awarded a contract for a 1-story addition, 40 x 65 feet.

NEW HAVEN, CONN.—A $150,000 power plant addition is contemplated by the Connecticut Co., operator of electric power utilities.

NEW HAVEN, CONN.—The Economy Bottle Washing Machine Co. has been incorporated with $50,000 capital stock by John E. Ayers, Charles J. Ayers, Hartford, Conn., and Emanuel J. Boyler.

WATERBURY, CONN.—The Blake & Johnson Co., maker of metal goods, has increased its capital stock from $200,000 to $600,000.

SANFORD, FLA.—The Bright Light & Power Co. has been incorporated with $100,000 capital stock by Kate McIver, I. E. McIver and L. P. Campbell.

ALTON, Ill.—The Duncan Foundry & Machine Works is erecting an addition, 60 x 240 feet.

CHICAGO—The Peoples Gas Light & Coke Co., 122 South Michigan avenue, is having plans drawn for a 4-story shop building.

CHICAGO—The Advance Window Frame Co., 1818 West Austin avenue, plans a 1-story factory building, 125 x 125 feet, to cost about $45,000.

CHICAGO—The National Copper & Steel Tank Works, 1275 Wade street, has purchased a 1-story factory building, 75 x 125 feet, which was recently erected.

CHICAGO—The Chicago Clamp Co., 1535 West Taylor street, has been incorporated with $4500 capital stock by Samuel C. Bushan, John W. Maskell and Fred C. Spillner. The company is represented by Ruckberg & Burr, 111 West Monroe street.

CHICAGO—The Anderson Electric Works, Inc., 212 West Austin avenue, has been incorporated with $25,000 capital stock by Adolph C. G. Anderson, John C. A. Anderson and R. H. Johnson. The company is represented by Cassels, Potter & Gilbert, the Rookery.

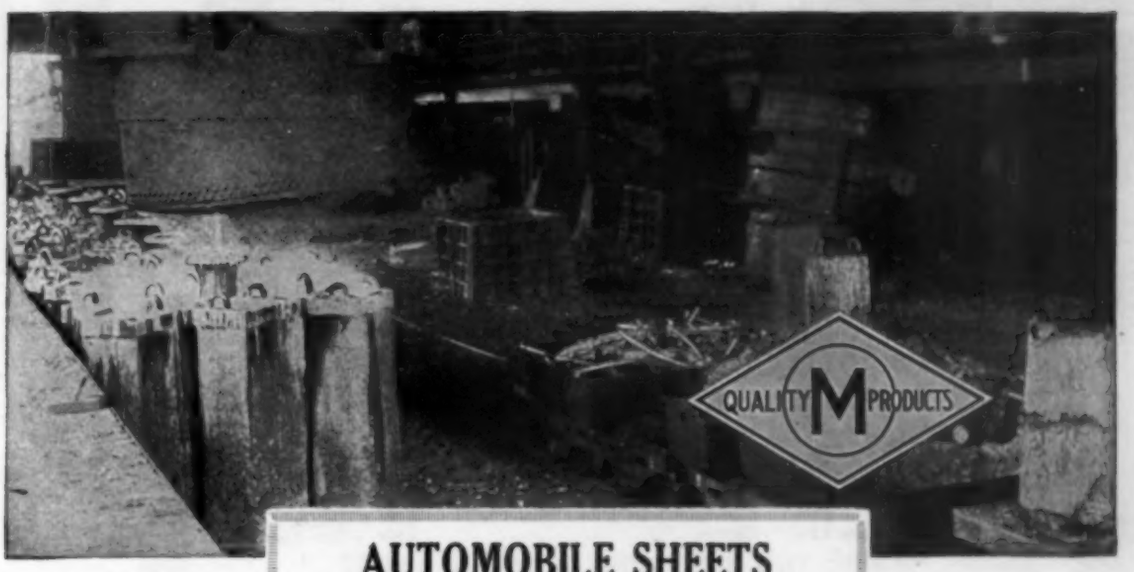
CHICAGO—The J. H. Valve Co., 19 South La Salle street, has been incorporated with $35,000 capital stock by A. Victor Hedin, Edward Todd, and Gordon Berg. The company is represented by Gordon Berg, 1002, 19 South La Salle street.

CHICAGO—The Wailhart Electric Mfg. Co., 1251 West Van Buren street, has been incorporated with $20,000 capital stock by A. J. Schmitt, Alfred Ploger and Charles J. Schmitt. The company is represented by Wisner & Walsh, 901 Monadnock block.

CHICAGO—The Great Lakes Iron & Metal

"MANSFIELD"

QUALITY SHEETS



Mansfield Sheets are made from our own *bottom-poured* ingots

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS

PICKLED and ANNEALED ENAMELING STOCK

For Vitreous Enameling

STOVE PIPE STOCK and ELBOW STOCK

Uniform Color Blue

MILK CAN STOCK

We solicit your inquiries

Mansfield Sheets are unusually low in sulphur

The Mansfield Sheet and Tin Plate Co.

MANSFIELD, OHIO

District Sales Representatives

The L. D. Rockwell Co., No. 2 Rector St., New York, N. Y.; D. B. Coey, 1018 Standard Oil Building, Chicago, Ill.; Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.; The L. D. Rockwell Co., No. 1201 National Bank Bldg., Cleveland, O.; The Maynard French Steel Co., 516 Mercantile Library Bldg., Cincinnati, O.; Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.; Walter G. Clark, Inc.,313 American Bank Bldg., Kansas City, Mo.; Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.; Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.; Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.; Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.; Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.; Wm. P. Horn Co., Dekum Bldg., Portland, Oregon; Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.; Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ontario, Canada.

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.065c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	2.95c to 3.10c
Cleveland	2.91c
Detroit	3.00c
New York	3.04c
Philadelphia	3.025c
San Francisco	3.40c
Seattle	3.60c
St. Louis	2.90c
St. Paul	3.05c
Los Angeles	3.50c

IRON BARS

Boston	3.065c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	3.10c
Detroit	3.00c
New York	3.04c
Philadelphia	3.025c
St. Louis	2.90c

SHAPES, STRUCTURAL

Boston	3.165c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	3.05c to 3.20c
Cleveland	3.01c
Detroit	3.10c
New York	3.14c
Philadelphia	3.125c
San Francisco	3.40c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.60c

PLATES

Boston	3.165c
Boston 3/16-inch	3.04c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	2.95c to 3.20c
Cleveland	3.01c
Detroit	3.10c
New York	3.14c
Philadelphia	3.125c
Philadelphia, 1/4-inch	3.33c
San Francisco	3.50c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.75c

NO. 10 BLUE ANNEALED SHEETS

Boston, 1/4-inch	4.15c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	3.75c to 4.00c
Cleveland	3.70c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.00c
Cleveland	4.40c
Detroit	4.90c
New York	4.90c
Philadelphia	4.60c
San Francisco	6.05c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c

NO. 28 GALVANIZED SHEETS

Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.20c
Cleveland	5.40c
Detroit	5.90c
New York	5.90c
Philadelphia	5.75c
San Francisco	6.90c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c

BANDS

Boston	4.25c
Buffalo	3.90c
Chicago	3.55c
Cincinnati	3.70c to 3.85c
Cleveland	3.71c
Detroit	3.80c
New York	3.84c
Philadelphia	3.825c
San Francisco	4.05c
Seattle	4.35c
Los Angeles	4.40c

HOOPS

Boston	4.75c
Buffalo	4.10c
Cleveland	3.71c
Detroit	4.20c
New York	4.39c
Philadelphia	4.25c
Seattle	5.00c

COLD ROLLED STEEL

Boston (rounds)	4.00c
Boston (shapes)	4.50c
Buffalo (rounds)	3.95c
Buffalo (shapes)	4.45c
Chicago (rounds)	3.80c
Chicago (shapes)	4.30c
Cincinnati (rounds)	3.75c
Cleveland (rounds)	3.75c
Cleveland (shapes)	4.25c
Detroit (rounds)	3.80c
Detroit (shapes)	4.30c
New York	3.90c
New York (shapes)	4.40c
Philadelphia (rounds)	3.85c
Philadelphia (shapes)	4.35c
San Francisco	5.00c
Seattle	5.25c
Los Angeles	5.10c

Co., 110 South Dearborn street, has been incorporated with $15,000 capital stock by Ernest W. Fink, William Miller and Maurice A. Getz. The company is represented by William J. Andrews, 906, 105 West Monroe street.

JOLIET, Ill.—The Rathbun Hydro Meter Co., 318 Barber building, has been incorporated with $10,000 capital stock by John V. McCarthy, T. V. Gorey and Milo D. Rathbun. The company is represented by Gorey & Gorey, 318 Barber building.

EVANSVILLE, IND.—The Evansville Enameling Co. plans a 1-story factory addition, 50 x 80 feet, to cost about $15,000.

INDIANAPOLIS—The Puritan Bed Spring Co., 902 Kentucky avenue, plans to rebuild its enameling department which recently was damaged by fire.

LOUISVILLE, KY.—The Standard Sanitary Mfg. Co. is reported planning plant additions.

LOUISVILLE, Ky.—The National Forge Co., 1572 Cherokee road, will erect a 1-story foundry, 60 x 120 feet.

BALTIMORE—The Holland Mfg. Co., tacks, is reported planning a plant addition.

BALTIMORE—The Power Jack & Accessories Co., 105 Pleasant street, has been incorporated with $30,000 capital stock by William C. Robinson, Henry L. Duer and Jesse Slingluff.

BALTIMORE—The Welding Service Corp., 2700 Boston street, has been incorporated with $25,000 capital stock by Albert Lorch, Frank L. Druliner and William L. Emich.

ST. MICHAELS, Md.—Harry Evans plans 1-story machine works to replace his shop recently damaged by fire.

BOSTON—The Kinney Mfg. Co., 3541 Washington street, plans a 1-story addition.

MALDEN, Mass.—The Lander Welding Co., 41 Chester street, plans a 1-story manufacturing building, 40 x 50 feet.

NORTH BOSTON, Mass.—The William H. Field Co., 39 Washington street, is erecting a 1-story building, 60 x 250 feet.

WORCESTER, MASS.—The Sweeper Vac Appliance Co. has been incorporated with $25,000 capital stock by Henry R. King, Clifford L. Wright and Walter L. Chandler.

FERNDALE, Mich.—The Ferndale Auto Parts Co. has been incorporated with $20,000 capital stock to manufacture automobile parts, etc., by V. S. Oberkoetter and Albert C. Ratz, 4911 Wabash avenue, St. Louis.

LUDINGTON, MICH.—The plant of the Monroe Body Co., recently was damaged by fire.

TRENTON, N. J.—The Freeman Electric Co. plans a 1-story addition, 40 x 70 feet.

TRENTON, N. J.—The Eberhardt Watch Corp. is revising plans for a factory building.

TRENTON, N. J.—The Empire Tire & Rubber Co. has started work on a factory addition, one story, 48 x 90 feet.

TRENTON, N. J.—The New Jersey Wire Cloth Co. has increased its capital stock from $500,000 to $1,000,000.

BATAVIA, N. Y.—The Gray Machine & Parts Corp. plans a plant addition.

BROOKLYN, N. Y.—The Empire Tinware Co., 33 South Fifth street, plans a 4-story addition, 100 x 125 feet, to cost about $35,000.

BROOKLYN, N. Y.—The Century Art Metal Co. has been incorporated with $10,000 capital stock by G. Korngreen, R. C. Andrews and C. Stark. The company is represented by Niebrugge & Maxfield, 233 Broadway.

BROOKLYN, N. Y.—A $200,000 garage and repair station, 130 x 190 feet, will be erected in Kingston avenue, from plans prepared by Edward M. Adelsohn, 1778 Pitkin avenue.

EASTWOOD, N. Y.—The Pierce, Butler & Pierce Mfg. Corp. plans improvements to its foundry.

JAMESTOWN, N. Y.—The Hjorth Tool Corp. has been incorporated with $75,000 capital stock by E. D. Cook, A. D. Stitt and W. F. Opdyke. The company is represented by C. S. Grover, attorney.

NEW YORK—The United Electric Light & Power Co. has increased its capital stock from $6,000,000 to $12,697,100.

NEW YORK—The British-American Metals Co., Inc., 200 Broadway, plans a 1-story addition to its plant at Plainfield, N. J., to be 40 x 150 feet and cost about $25,000.

NEW YORK—The Kahan Pipe & Equipment Co. has been incorporated with $10,000 capital stock by R. Glick, W. Ginsberg and R. Gottlieb. The company is represented by J. W. Gottlieb, 44 Court street, Brooklyn, N. Y.

NEW YORK—Lockwood, Greene & Co., 101 Park avenue, are engineers, in charge of an addition to the Locomobile Co. of America, Inc., Bridgeport, Conn., now getting under way. The extension includes a 60 x 180-foot machine shop addition and a 40 x 200-foot addition to a manufacturing unit.

NIAGARA FALLS, N. Y.—The Acheson Graphite Co. plans a 1-story addition.

ROCHESTER, N. Y.—The Eastman Kodak Co., 343 State street, plans a machine building.

TONAWANDA, N. Y.—The American Kar-

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

dex Co., 21 West Swan street, has had plans drawn for a 2-story factory building, 50 x 160 feet.

CARTHAGE, N. C.—Sugg Bros. will erect a machine shop, 40 x 80 feet, and will install lathes, drill press, shaper, planer, etc.

ASHTABULA, O.—The Northern Oil & Gas Co. is reported considering the erection of an artificial gas plant.

CINCINNATI—The Cincinnati Milling Machine Co. has been incorporated with $6,000,000 capital stock by Fred A. Geier, C. Wood Walter and others.

CLEVELAND—The William Plotz Machine & Forge Co. has been incorporated with $25,000 capital stock by Louis H. Wierberm, E. J. Albl, and others.

CLEVELAND—A company is being formed to take over the plant of the Ohio Motor Vehicle Co. It is understood the company, which is being organized by J. G. Blackstock, will manufacture hard rubber products.

CONNEAUT, O.—The Walt Mfg. Co. is reported considering the erection of a plant unit here.

LIMA, O.—The Vapo Stove Co. will start work shortly on a plant building.

LIMA, O.—Work will be started soon on a plant for the Perfect Point Pencil Co.

LIMA, O.—The Lima Sheet Metal Products Co. has a permit to erect a building addition at a cost of $6600.

LORAIN, O.—The Midland Seamless Tube Co. is being organized. It will take over the plant of the Cromwell Steel Co.

MARION, O.—The Fairfield Engineering Co. is reported planning a plant here, 1-story, 50 x 80 feet.

NILES, O.—The Niles Furnace Co. has been incorporated with $50,000 capital stock by S. H. Smith, Archie L. Kann, and others.

TOLEDO, O.—The Summit-Roberts Tool Co. has been incorporated with $10,000 capital stock by Beth Price, Edith Samsen and others.

TOLEDO, O.—Bids are to be taken Dec. 3 for a 1-story machine shop, 125 x 300 feet for the Owens Bottle Co.

TOLEDO, O.—The American National Co., manufacturer of metal toys, has purchased a site adjoining its plant on which it is reported planning to build an addition, 7-stories, 100 x 300 feet.

CARBONDALE, PA.—Plans are being prepared by the American Welding Co. for a plant near New York for the manufacture of tractors. A brass foundry, iron foundry and a machine shop will be included among the various departments.

FULLERTON, PA.—Part of the plant of the Fuller-Lehigh Co. recently was damaged by fire.

MONESSEN, PA.—The Monessen Foundry & Machine Co. plans to rebuild the part of its plant recently damaged by fire.

NEW CASTLE, PA.—The plant of the Standard Wire Co. recently was damaged by fire.

PHILADELPHIA—The Abrasive Co. has awarded the Pittsburgh-Des Moines Steel Co. the contract to erect a 1-story addition.

PHILADELPHIA—Plans are being prepared by Leroy B. Rothschild, for a plant addition for the H. C. Aberle Co.

PHILADELPHIA—The general contract for an $80,000 plant addition for Bennett & Aspeden has been awarded to Wm. Steele & Sons Co.

PHILADELPHIA—Contract for a $20,000 warehouse for the Merchants Warehouse Co. has been awarded to the George Kessler Contracting Co.

PHILADELPHIA—The American Insulation Co., Roberts and Stokley streets, has awarded a contract to William Steele & Sons Co., for a building to cost about $25,000.

PHILADELPHIA—The Belgrade Iron Works has been incorporated with $100,000 capital stock. It is represented by the Corporation Guarantee & Trust Co.

PITTSBURGH—Hubbard & Co., 6301 Butler street, manufacturer of bolts, nuts, rivets, etc., plans a 1-story building to cost about $20,000.

PITTSBURGH—The foundry and pattern shop of the Velte Foundry & Machine Co., near Mars, Pa., were damaged by fire of undetermined origin Nov. 23, with a loss of about $40,000.

PITTSBURGH—The Simmons Co., 824 River street, manufacturer of metal beds, etc., is taking bids for a 2-story branch plant here, to be 180 x 195 feet and cost about $150,000.

GREENVILLE, S. C.—E. M. Wharton and John W. Jones plan to establish a plant for the manufacture of mechanical devices.

CHATTANOOGA, TENN.—Street Bros. Machine Works, Inc., has been formed, being a consolidation of the Patten Mfg. Co. and Street Bros. Machine Works. J. H. Street is president.

JACKSON, TENN.—The Illinois Central railroad plans a 1-story, 75 x 200-foot machine shop addition.

MEMPHIS, TENN.—The Tennessee Sheet Metal Works has been incorporated by L. A. Walker, C. J. Holden and I. D. Heckle.

NANSEMOND, VA.—G. D. Gravely, Richmond, Va., is reported interested in a project which includes the erection of a plant here for the manufacture of cultivators, tractors, etc.

RICHMOND, VA.—The Metal Window Mfg. Corp. has been incorporated with $100,000 capital stock by Charles T. Norman, Edward Whitlock and others.

WINCHESTER, VA.—Options have been taken on 2500-acres by a group of Detroit financiers as a site for a proposed $10,000,000 automobile plant. The property under consideration is at Ridgeway, W. Va., near here.

CHARLESTON, W. VA.—Griffith, Rodes & Co., sheet metalworking, has increased its capital stock to $20,000 and plans installing additional equipment.

HUNTINGTON, W. VA.—The Huntington Iron Works plans a plant building, 45 x 120 feet.

LOGAN, W. VA.—The Logan Cut-Out Switch Mfg. Co. has been incorporated with $50,000 capital stock by T. A. and Robert Thomas, both of Amherstdale, W. Va., and J. Abraham, Omar, W. Va.

WHEELING, W. VA.—The La Belle Iron Works has obtained a permit to erect a boiler house at an estimated cost of $8000.

APPLETON, WIS.—The All-American Steel Casket Co., capital stock $50,000, has been incorporated in Wisconsin by J. A. Burrichter and Edward A. Walters of St. Paul, Minn., who purchased 200 acres at Nichols, Outagamie county, and will build a factory for the manufacture of metallic caskets and coffins. Excavation is under way.

CEDARBURG, WIS.—The Hausen Canning Machine Corp., Port Washington, Wis., will build a 1-story factory, 100 x 120 feet, here at a cost of $75,000.

CHIPPEWA FALLS, WIS.—The newly organized Automobile Gasoline Gauge Mfg. Co., a $50,000 company with headquarters at Eau Claire, Wis., is planning to locate its factory here. C. K. Knoblauch is president and general manager.

CLINTON, WIS.—Robert Wark, formerly of the Koustine Co., sanitary engineers, Buffalo, N. Y., and now of Clinton, has incorporated Robert Wark & Co., Inc., with $20,000 capital, to manufacture septic tanks, chemicals, storage tanks, etc. A plant is being equipped in the Jones building on Main street.

CRANDON, WIS.—The Vulcan Last Co. will rebuild its plant which recently was damaged by fire.

HATTIESBURG, MISS.—The Acme Flooring Co., organized with $500,000 capital stock, plans to erect a plant here.

KENNAN, WIS.—Earl D. Jackson, consulting engineer, Endicott building, St. Paul, Minn., has the contract to plan and supervise the construction of a water supply and sewage system for this village.

MILWAUKEE—The Harley-Davidson Motorcycle Co. plans a 1-story plant addition.

MILWAUKEE—The capital stock of the Motor Castings Co. has been increased from $15,000 to $30,000. The foundry at 425-429 Fifty-sixth avenue will be enlarged.

MILWAUKEE—The Milwaukee Gas Specialty Co. will build a machine shop at 2017-2025 Clybourn street, at a cost of $35,000. Bids will close Dec. 1.

MILWAUKEE—The Excel Mfg. Co., woodwork, has awarded contracts for a 2-story, L-

Business Changes

THE Electric Material Co., 589 Howard street, San Francisco, with a branch office in the Title Insurance building, Los Angeles, has been appointed agent in Washington and parts of Oregon and Idaho for the Roller-Smith Co., 233 Broadway, New York. The Electric company will handle the Roller-Smith line of electrical instruments, circuit breakers and radio apparatus. In addition to its San Francisco and Los Angeles offices, the Electrical Material Co. recently opened an office in the Hinckley building, Seattle.

* * *

The Witherow Steel Co., Pittsburgh, has opened a branch office at 3-252 General Motors building, Detroit, in charge of J. S. Langston as district manager and L. A. Daines as his assistant.

* * *

After Dec. 1, the plant and offices of the Gibb Instrument Co., Detroit, will be located at Bay City, Mich. This company manufactures automatic and semiautomatic arc, spot and steam welders.

* * *

The Chicago Bridge & Iron Co., San Francisco, has moved its offices from 232 Rialto building to 338 Rialto building. F. L. Cook is Pacific coast manager.

DAILY METAL TRADE
PIG IRON OUTPUT CAME RIGHT BACK LAST MONTH
Total of 45 Blast Furnaces Went On To Active List, Most Which Are Steel Works
CLEVELAND, Oct. 4.—The rapid come-back of the blast furnace industry in the past 30 days is shown by the September production statistics which indicate an aggregate of 2,016,778 tons, a gain of 206,113 tons over August with its output of 1,810,665 tons. A net increase of 45 stacks in the active list, according to the Iron Trade Review, shows the healthy recovery in another way.
Merchant iron produced in September totaled 349,087 tons compared with 343,522 tons in August,

Daily Metal Trade is the leading national daily newspaper devoted to iron and steel, nonferrous metals, alloys, coal and other raw materials. Its domestic and foreign news, market and business reports pertaining to its field are unexcelled by any daily newspaper in America.

400 Newspapers Regularly Quote

IRON TRADE REVIEW

CLEVELAND

The internatianal reputation and the World-wide circulation of the IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

shaped factory addition, 60 x 180 and 60 x 230 feet, at 3402-3412 South Pierce street.

MILWAUKEE—The Perfection Mfg. Co., capital stock $25,000, has been incorporated by Joseph L. Schmidling, E. Kuebner and Edward A. Sprogg to manufacture automobile accessories and supplies.

MILWAUKEE—The Sprinkler Equipment Co. has been incorporated with $100,000 capital stock by Emmett A. Donnelly, attorney, 120 Wisconsin street; C. Healy Powell and Wallace S. Schuta to manufacture fire protection systems.

MILWAUKEE—Articles of incorporation have been filed by the Royal Fixture Corp., 85 Thirty-fifth street, manufacturing electric light fixtures, electrical devices, etc. The incorporators are Sam Rebuchim, David C. and A. L. Loppin, 679 Forty-eighth street.

MILWAUKEE—The Wetmore-Gibbons Co., capital stock $20,000, has been incorporated by C. P. Wetmore, head of the Wetmore Mechanical Laboratories Co., to manufacture intricate mechanical instruments. A. C. Gibbons and Dean Farley are associated with him.

RACINE, WIS.—The Belle City Malleable Iron Co. plans a 1-story annealing plant, 77 x 153 feet.

WAUKESHA, WIS.—A shop and service floor addition, 60 x 178 feet, will be built by the Spring City Auto Co. to cost $22,000. Inquiry is being made for fixtures and floor equipment.

WAUKESHA, Wis.—The Federal Bridge & Structural Co., Waukesha, has the contract to plan and erect a 1-story garage and repairshop addition, 65 x 190 feet, for the Spring City Auto Co.

WAUKESHA, WIS.—The Federal Bridge & Structural Co., Waukesha, has the contract to erect a 1-story garage and repair shop addition, 65 x 190 feet, for the Spring City Auto Co.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Mesabi Bessemer, 55 per cent iron	5.70
Old Range nonbessemer, 51½ per cent iron	5.20
Mesabi nonbessemer, 51½ per cent iron	5.05

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	9.50 to 10.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports.

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent	10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 68 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 54 per cent	8.00 to 9.00

Manganese Ore

Brazilian, minimum 47 per cent c.i.f. Atlantic ports, 29 cents per unit, nominal. (Equivalent to $24.67 per gross ton or 51.4 cents per unit, duty paid, tidewater.)

Indian 48 to 50 per cent c.i.f. Atlantic ports, nominal.

Caucasian, 52 per cent, c.i.f. Atlantic ports, nominal.

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton	$21.50

Rivets

Structural rivets, Pittsburgh	3.00c to 3.15c
Boiler rivets, Pittsburgh	3.10c to 3.25c
Rivets, ⅞-inch and smaller	65 off to 65-5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts ⅞-inch and smaller	70-10-5 off
Case hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
⅜ x 6 inches, smaller and shorter

Rolled thread	50-10-5 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60-5 off
Cut thread	50-10 off
Larger and longer	50-10 off
(⅜ x 4 inches, cold punched nuts)	
Cut thread	45 off
Larger and longer	45 off
Lag screws	50-10 to 60-5 off
Plow bolts Nos. 1, 2 and 3 heads	30-5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	45 off

WASHERS

Wrought washers	$5.75 off list

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
Butt Weld		
⅛-inch	49	23½
¼ and ⅜-inch	55	29½
½-inch	60	46½
¾-inch	64	52½
1 to 3-inch	66	54½
Lap Weld		
2-inch	59	47½
2½ to 6-inch	63	51½
7 to 8-inch	60	47½
9 to 12-inch	59	46½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	64	52½
Lap Weld		
2-inch	57	45½
2½ to 6-inch	61	49½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	45	28½
¼ and ⅜-inch	51	34½
½-inch	57	46½
¾-inch	62	51½
1 to 1½-inch	64	53½
2 to 3-inch	65	54½
Lap Weld		
2-inch	57	46½
2½ to 4-inch	61	50½
4½ to 6-inch	60	49½
7 to 8-inch	56	43½
9 to 12-inch	50	37½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	46	36½
¾ to 1½-inch	49	39½
2 to 2½-inch	51	41½
Lap Weld		
2-inch	45	36½
2½ to 4-inch	47	38½
4½ to 6-inch	46	37½
7 to 8-inch	42	29½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+ 7	+33
½-inch	26	8
¾-inch	32	17
1 to 1½-inch	34	19
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	29	15
2½ to 6-inch	32	19
7 to 12-inch	30	17
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+13	+48
½-inch	25	13
¾-inch	32	18
1 to 1½-inch	34	20
Lap Weld		
2-inch	30	17
2½ to 4-inch	33	21
4½ to 6-inch	32	20
7 to 8-inch	25	13
9 to 12-inch	20	8

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+37½	+49½
¾-inch	+18	+30
1-inch	+34	+46
1¼-inch	+18	+30
1½-inch	+17	+29
Lap Weld		
2 and 2½-inch	+ 3	+15
3 to 4-inch	2	+ 7
4½ to 6-inch	1	+ 7
8-inch	+ 4	+ 8

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL	
1¼-inch	17½
2 and 2¼-inch	32
2½ to 3-inch	43
3¼ to 4-inch	48
CHARCOAL IRON	
1½-inch	+11
1¾-inch	+ 1
2 and 2¼-inch	9
2½ to 3-inch	14
3¼ to 4½-inch	16
SEAMLESS COLD DRAWN	
1-inch	51
1¼ and 1½-inch	43
1¾-inch	27
2 and 2¼-inch	30
2½ and 2¾-inch	34
3-inch	38
3¼ to 4-inch	43
4½ and 5-inch	35
SEAMLESS HOT ROLLED	
3-inch	40
3¼ to 4-inch	45

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	85 off
Carbon, 0.30 to 0.40 per cent	83 off
Carbon, 0.40 to 0.50 per cent	82 off

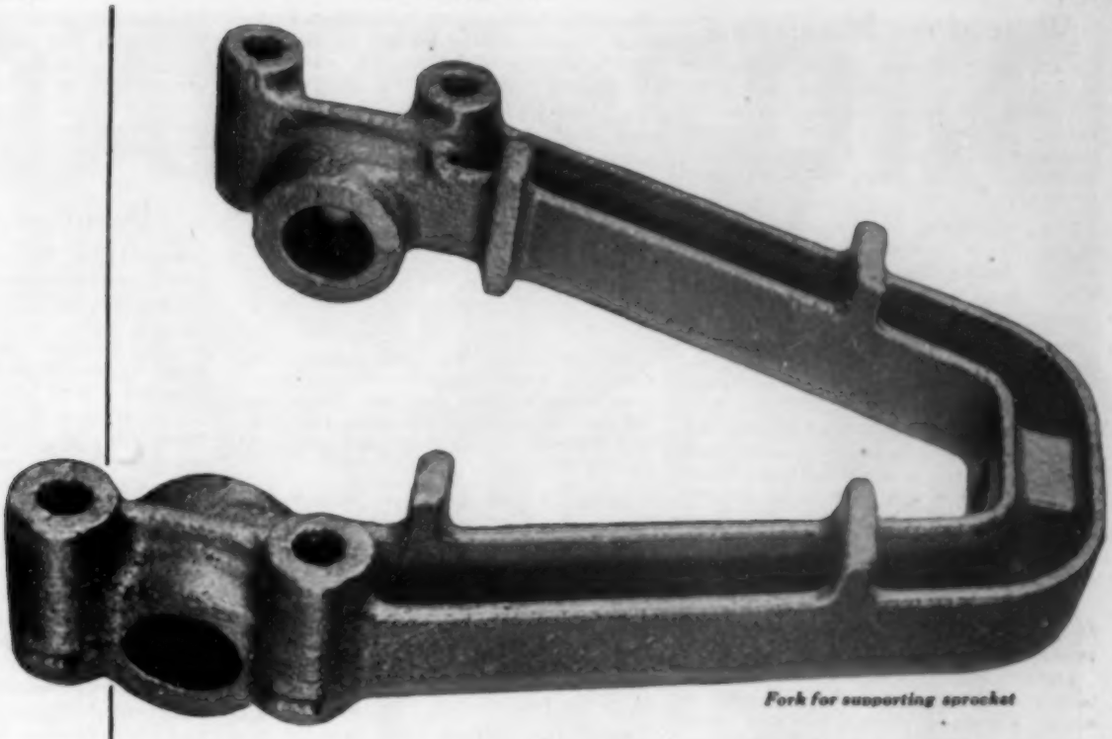
Plus usual differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	19c
3-inch	7-gage	34c
1½-inch	9-gage	13¾c
5⅛-inch	9-gage	53c
5½-inch	9-gage	55c

Plus usual extras for forming and for long lengths.



Fork for supporting sprocket

SIVYER (S) CASTINGS

DEPENDABLE

Assuring Interior Integrity

Walls five sixteenths of an inch thin, in conjunction with bearings relatively thick, make it impractical to forge the hanger shown above.

Open hearth practice does not permit the high temperature necessary for pouring sections that vary so much and so sharply.

In Sivyer Electric Steel, however, this hanger is being produced in the uniformly flawless form made necessary by the service and machining demands. The superiority of the electric furnace for certain purposes is, of course, only partly responsible for the successful production of parts like these.

Sivyer molding practice is even more important.

Before producing the casting shown here, it was necessary to make a number by various molding methods; these were sawed through at critical points, and tested in other ways, to make sure that no shrinks or strains occurred in the interior of the castings.

In this way the special molding methods suggested by Sivyer experience and research were thoroughly tested until a practice was established that produced castings uniformly smooth and absolutely sound.

The resulting production showed an exceptionally satisfactory cost for the operations necessary to bore their required seven holes and to machine fourteen faces.

Send Blue Prints

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

One of three classes of steel parts

A NUMBER of manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically or cannot be forged at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel. The hanger shown above is one of several parts, in the same assembly, belonging in the last named class. The high temperature at which Sivyer Steel can be poured, the accurate control of its composition, and the thorough molding practice that experience and research have developed, assure uniformly economical machining and absolute interior integrity.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

West of the Mississippi

FRESNO, CAL.—The United Engine Machine Co. has been incorporated with $250,000 capital and will build four buildings including a machine shop, foundry and molding shop, pattern shop and forge shop. G. J. Dolan Jr., and D. Sulprizio are the incorporators.

LOS ANGELES—The Celite Products Co. shortly will call for bids for construction of 4 miles of standard gage railroad in Santa Baraba county.

LOS ANGELES—The Teetor Adding Machine Co., 502 Pacific Finance building, has awarded a contract to Hamm & Grant, Ferguson building, for a 2-story plant building at Pomona, Cal., to be 100 x 300 feet.

POMONA, CAL.—The Teetor Adding Machine Co., according to an announcement made by H. W. Lamport, president and general manager, will erect a fireproof plant on property located on West Second street.

SAN FRANCISCO—J. H. Hjul will erect a $26,000 garage and repair shop for Tom Lavell at O'Farrell and Hyde streets.

DENVER, COLO.—The R. Hardesty Mfg. Co., manufacturer of power equipment, is reported planning a plant.

BOISE, IDAHO—Oregon Short Line will build a railroad from Orchard to this city, including 27 miles of trackage, passenger station and freight terminals at a cost of $3,200,000.

WICHITA, KANS.—The Missouri Pacific railroad plans a 1-story machine shop here to cost $80,000.

WICHITA, KANS.—The Coleman Lamp Co., 220 North St. Francis street, has awarded a contract to John M. Denny, 1450 North Lawrence street, for a 1-story plant addition.

RED WING, MINN.—The Red Wing Sewer Pipe Co. plans to rebuild its plant damaged by fire.

ST. CLOUD, MINN.—The Great Northern railroad plans a roundhouse here.

ST. PAUL, MINN.—Henry H. Orme of this city has organized the Henry Orme Co. to manufacture utensils used by railroads. Associated with him are Thomas D. Hogan, of Evanston, Ill., and T. C. Brudenell, Oak Park, Ill. The company has been incorporated under Delaware laws for $200,000.

BROOKFIELD, MO.—The North Missouri Power Co. plans improvements to its electric light plant.

HILLSBORO, MO.—The Apt Co., 3620 West Pine boulevard, St. Louis, plans a plant at an estimated cost of $30,000, for the manufacture of railroad spikes, tie plates, etc. W. E. Apt is president.

HOLT, MO.—The Holt Electric Light Co. recently was organized with $5000 capital stock by W. A. McGee, J. A. Eby, Excelsior Springs, Mo., and others.

KANSAS CITY, MO.—The Kansas City Bolt & Nut Co. is reported planning plant extensions.

KANSAS CITY, MO.—The Kansas City Oxygen Gas Co. plans a 2-story plant building, 18 x 48 feet.

KANSAS CITY, MO.—The Aerometer Co., 1215 West Eighth street, recently organized to manufacture machinery, etc., with $350,000 capital stock, has awarded a contract to Fred Crites, 2136 Belleview avenue, for a 1-story plant building, 118 x 120 feet.

SEDALIA, MO.—The City Light & Traction Co. has plans for a power house.

ST. LOUIS—The Grimm Metal Sign Corp. has been incorporated with $50,000 capital stock by H. A. Grimm, W. S. Faires and Hans Tandberg.

ST. LOUIS—The Haynes-Langenberg Mfg. Co., furnaces, will complete a 3-story building, 150 x 300 feet.

BILLINGS, MONT.—The Midland Iron Works is erecting a branch plant at Shelby, Mont., 30 x 60 feet.

WELEETKA, OKLA.—The Colonial Supply Co. is reported planning to establish a machine shop and supply house here.

TILLAMOOK, OREG.—Coast Power Co. is spending $150,000 on improvements to its electric power plant.

DALLAS, TEX.—Capitalized at $50,000, the American Iron & Metal Corp. has been incorporated by Herman Cohen, R. H. Nathan and M. W. Townsend.

HOUSTON, TEX.—The Reeves & Skinner Machinery Co., St. Louis, capitalized at $50,000 has been licensed to do business in Texas with J. J. Foster as state agent.

STAMFORD, TEX.—The West Texas Utilities Co. plans to expend about $45,000 on improvements to its plant.

TACOMA, WASH.—City officials have awarded to the American Cast Iron Pipe Co. the contract for furnishing cast iron water pipe for extension of the municipal water system. The contract price is $46,119.15.

OLYMPIA, WASH.—Gas explosion partially wrecked the plant of the Olympia Forge Works.

VANCOUVER, WASH.—Oregon Metals Recovery, Inc., has been incorporated with $250,000 capital by J. E. Hopkins, J. D. Hamil. n and E. C. Keller.

Business in Canada

NORDIN, B. C.—The J. Buckley estate will rebuild sawmill here recently damaged by fire.

VANCOUVER, B. C.—The contract for the Canadian Pacific railway pier, which will cost between $1,500,000 and $2,000,000 has been awarded to the E. Junkins Co., Winnipeg and Vancouver. Work will be started immediately.

VANCOUVER, B. C.—The British Columbia Electric Co., in addition to extensive improvements to its present power plant on Stave river, is planning erection of a plant farther down the river. The new plant will develop 100,000 horsepower.

ST. JOHN, N. B.—Stetson-Cutler & Co. will rebuild its planing mill here recently damaged by fire.

BRANTFORD, ONT.—The Brantford Brass Foundry Co., Ltd., has been incorporated with $100,000 capital stock by David L. Webster, Alfred Serjeant and Thomas E. Hutton.

BRIDGEBURG, ONT.—The National Brake Co., Ellicott building, Buffalo, N. Y., is making arrangements for a plant here.

ELMIRA, ONT.—Superior Pistons, Ltd., has been incorporated with $120,000 capital stock by Peter F. Stumpf, C. Dreisinger and George Klinck.

FORD, ONT.—The Canadian Bridge Co., Walker road, Walkerville, Ont., has the steel contract for a machine shop for the Ford Motor Co. of Canada.

MOUNT DENNIS, Ont.—The plant of the Electroplax Co., manufacturer of electrical insulation equipment, etc., was damaged by fire with a loss of $100,000.

OSHAWA, ONT.—John Bailes & Sons has been incorporated to manufacture trucks, tractors, etc., with $100,000 capital stock by Frederick J. Bailes, Charles R. Bailes and Harold D. Wilson.

RENFREW, ONT.—The larger portion of the plant of the O'Brien Scales Co. was damaged by fire recently.

RODNEY, ONT.—The town council will build a waterworks plant and system to cost about $40,000. J. W. McRae is clerk.

New Trade Publications

CHAIN—The Brown Hoisting Machinery Co., Cleveland, has just published a new catalog on drop forged chain for conveyors and elevators. The material given in the booklet is valuable and interesting.

ICE BREAKERS—The H. S. B. W.-Cochrane Corp., Philadelphia, has published a small booklet in which ice breakers for preparing ice are described and illustrated. The booklet contains 30 pages.

HYDRAULIC EQUIPMENT—The Aldrich Pump Co., Allentown, Pa., has published a 36-page illustrated booklet in which hydraulic equipment is described and illustrated. The equipment described includes various types of accumulators, intensifiers and reducers, forcing and forming presses, vises, trimming, straightening and bending presses, pumps of various types, etc. Specifications are given.

HEATER—The B. F. Sturtevant Co., Boston, has published a 16-page illustrated bulletin in which unit heaters for industrial plants are described and illustrated. The illustrations are of several actual installations. Specifications are given.

WATER HEATERS—A 16-page booklet has been published by the H. S. B. W.-Cochrane Corp., Philadelphia, in which the use of heaters for protecting boilers and steel tube economizers, also the piping of heating and hot water service systems, against oxygen corrosion, is described.

PANEL BOARDS—The Sprague Electric works of the General Electric Co., New York, is circulating a leaflet in which safety-type panel boards and cabinets are described and illustrated. These panels and boards are designed for places where the bus-bars and other live parts must be covered, yet the fuse plugs left accessible.

ASH EJECTOR—An 8-page illustrated booklet has been published by the Victor Engineering Co., Philadelphia, in which ash ejectors are described and illustrated. These ejectors are operated solely by a steam nozzle which directs a jet of steam through an inclined pipe, thereby creating a powerful suction in the horizontal section of the ejector located under the floor and a great pressure beyond nozzle up to the discharge end.

Service

Service is the very life blood of this organization. That we buy and sell coal, coke, iron, and steel is, after all, incidental. The service we render is what counts.

Anyone with a little money can buy coal, coke, etc.; any good salesman can sell a certain amount of the same; but only untiring care, ability and the desire to serve your interests as if they were our own, can build up an efficient organization such as ours.

Service which lifts the burden of fuel supply worry from your shoulders and places it upon ours; a group of men who know where to get coal and coke, how to get it, what kind and the proper uses for that particular kind, to say nothing of the ability to put just what you need in your yards, when you need it—this is only a suggestion of what the word service means to International and to those with whom we do business.

FUEL IRON
TRADE MARK

International Fuel & Iron Corporation

Philadelphia Pittsburgh Cincinnati

International

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$14.00 to 15.00
Boston (dealers)	13.00 to 14.00
Chicago	17.00 to 17.50
Buffalo	19.00 to 19.50
Cincinnati	16.50 to 17.00
Cleveland	18.50 to 19.00
Eastern Pennsylvania	16.00 to 17.00
New York (dealers)	13.00 to 13.50
Pittsburgh	20.50 to 21.00
San Francisco	12.50 to 13.00
St. Louis	15.50 to 16.00
Valleys	20.50 to 21.00
No. 1 railroad steel New York (dealers)	13.75 to 14.25

BUNDLED SHEETS

Buffalo	$14.00 to 15.00
Cleveland (hydraulic)	16.75 to 17.25
Cincinnati	12.00 to 12.50
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	18.00 to 18.50
St. Louis	9.00 to 9.50
Valleys (hydraulic)	19.00 to 19.50

STEEL RAILS, SHORT

Birmingham	$14.00 to 15.00
Boston (dealers)	13.00 to 14.00
Chicago	19.00 to 19.50
Cincinnati	19.00 to 20.00
Cleveland	16.25 to 17.00
St. Louis	19.00 to 19.50

STOVE PLATE

Birmingham	$15.00 to 16.00
Boston (consumers)	16.00 to 17.00
Buffalo	17.00 to 18.00
Chicago	18.50 to 19.00
Cincinnati (net)	14.00 to 15.00
Cleveland	17.00 to 17.75
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	13.00 to 14.00
Pittsburgh	17.00 to 17.50
St. Louis	15.50 to 16.00

LOW PHOSPHORUS

Buffalo	$21.00 to 22.00
Cincinnati	18.00 to 18.50
Eastern Pennsylvania	22.00 to 23.00
Pitts. billet and bloom crops	25.00 to 26.00

SHOVELING STEEL

Chicago	$16.50 to 17.00
Pittsburgh	17.50 to 18.00
St. Louis	15.00 to 15.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	$22.00 to 22.50
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	21.50 to 22.00
St. Louis	21.00 to 21.50

COMPRESSED SHEETS

Buffalo	$16.50 to 17.00
Chicago	14.25 to 14.75
Pittsburgh	19.00 to 20.00

FROGS, SWITCHES, GUARDS

Chicago	$17.00 to 17.50
Eastern Pennsylvania	16.00 to 17.00
St. Louis	15.00 to 15.50

BOILER PLATE, CUT

St. Louis (dealers)	$10.50 to 11.00

ANGLE BARS—STEEL

Chicago	$19.00 to 19.50
St. Louis	17.00 to 17.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$15.00 to 16.00
Boston (dealers)	14.00 to 14.50
Buffalo	19.00 to 19.50
Chicago, No. 1	17.50 to 18.00
Chicago, No. 2	17.00 to 17.50
Cincinnati, No. 1	14.50 to 15.50
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	19.00 to 20.00
Pittsburgh, No. 1	19.00 to 20.00
Pittsburgh, No. 2	20.50 to 21.00
New York, No. 1 (dealers)	16.00 to 16.50
St. Louis, No. 2	17.00 to 17.50
St. Louis	15.00 to 15.50

WROUGHT PIPE

Boston (dealers)	$9.50 to 10.00
Buffalo	14.00 to 14.50
Eastern Pennsylvania	14.00 to 14.50
New York (dealers)	10.75 to 11.25

YARD WROUGHT

Boston	$13.00 to 13.50
Eastern Pennsylvania, No. 1	17.00 to 18.00

CITY WROUGHT

New York, long	$13.00 to 13.50

BUSHELING

Buffalo, No. 1	$17.00 to 17.50
Chicago, No. 1	15.50 to 16.00
Chicago, No. 2	9.50 to 10.00
Cincinnati, No. 1	14.00 to 15.00
Cleveland, No. 1	12.75 to 13.00
Cleveland, No. 2	12.00 to 12.25
Eastern Pennsylvania, No. 1	14.50 to 15.00
Pittsburgh, No. 1	18.00 to 18.50
St. Louis, No. 1	14.00 to 14.50

MACHINE SHOP TURNINGS

Birmingham	$10.00 to 11.00
Boston (dealers)	11.00 to 11.50
Buffalo	15.00 to 16.00
Chicago	10.25 to 10.75
Cleveland	14.25 to 14.50
Cincinnati (net)	11.50 to 12.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	11.75 to 12.25
Pittsburgh	16.00 to 16.50
St. Louis	10.50 to 11.00
Valleys	15.75 to 16.00

CAST IRON BORINGS

Birmingham (chemical)	$15.00 to 16.00
Birmingham, borings (plain)	10.00 to 11.00
Boston (chemical)	17.00 to 17.50
Boston (dealers)	13.50 to 14.00
Buffalo	16.50 to 17.00
Chicago	14.75 to 15.25
Cincinnati (net)	12.00 to 12.50
Cleveland	15.00 to 15.50
Eastern Pennsylvania	15.00 to 16.00
Eastern Pennsylvania (chemical)	20.00 to 22.00
Pittsburgh	17.50 to 18.00
New York (dealers' price)	11.75 to 12.25
St. Louis	11.00 to 11.50
Valleys	17.25 to 17.50

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	11.00 to 11.50
Cleveland, small	15.50 to 16.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	11.75

IRON AXLES

Birmingham	$18.00 to 20.00
Boston	27.00 to 28.00
Buffalo	24.00 to 25.00
Chicago	27.50 to 28.00
Cincinnati	23.00 to 24.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	24.00 to 25.00
Pittsburgh	28.00 to 29.00
St. Louis	28.00 to 28.50

IRON RAILS

Buffalo	$19.00 to 20.00
Chicago	22.50 to 23.00
Cincinnati	16.00 to 17.00
Cleveland	18.00 to 18.50
St. Louis	20.50 to 21.00

PIPES AND FLUES

Chicago	$12.00 to 12.50
Cincinnati	11.00 to 12.00
Cleveland	15.00 to 15.50
St. Louis	10.50 to 11.00

RAILROAD GRATE BARS

Buffalo	$16.00 to 17.00
Chicago	18.00 to 18.50
Cleveland	17.00 to 17.75
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.50 to 13.00
St. Louis	16.00 to 16.50

FORGE FLASHINGS

Boston (dealers)	$11.00 to 11.50
Chicago, small	12.00 to 12.50
Cleveland	12.50 to 13.00
Cleveland, large	12.25 to 12.50

FORGE SCRAP

Boston	$9.00 to 9.50
Chicago	17.00 to 17.50
Eastern Pennsylvania, No. 1	15.00 to 15.50

ARCH BARS AND TRANSOMS

Chicago	$23.50 to 24.00
St. Louis	21.00 to 21.50

ANGLE BARS—IRON

Chicago	$23.50 to 24.00
St. Louis	21.00 to 21.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$12.00 to 12.50
Buffalo	17.50 to 18.50
Chicago	15.50 to 16.00
Cleveland	17.00 to 17.25
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	18.00 to 19.00
St. Louis	11.50 to 12.00

STEEL CAR AXLES

Birmingham	$18.00 to 20.00
Boston (dealers)	22.50 to 23.00
Buffalo	21.00 to 22.00
Chicago	20.00 to 20.50
Cleveland	22.00 to 22.50
Eastern Pennsylvania	24.50 to 25.00
New York (dealers)	20.50 to 21.00
Pittsburgh	22.00 to 23.00
St. Louis	20.00 to 20.50

SHAFTING

Boston (dealers)	$18.50 to 19.50
Chicago	22.50 to 23.00
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	16.00 to 16.50
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$16.00 to 17.50
Birmingham, tram car	16.50 to 18.00
Boston (consumers)	18.50 to 19.50
Buffalo, iron	21.00 to 22.00
Chicago, iron	24.00 to 24.50
Cincinnati	19.00 to 19.50
Eastern Pennsylvania, cupola	20.00 to 21.00
New York, iron (dealers)	21.00 to 22.00
Pittsburgh, iron	22.50 to 23.00
Pittsburgh, steel	21.50 to 22.00
St. Louis, iron	22.50 to 23.00

NO. 1 CAST SCRAP

Birmingham, cupola	$17.50 to 18.50
Boston (consumers)	22.00 to 23.00
Buffalo	21.00 to 22.00
Chicago, cupola	22.50 to 23.00
Cincinnati, No. 1, machinery, cupola (net)	21.00 to 22.00
Cleveland, cupola	21.00 to 21.75
Eastern Pennsylvania, cupola	20.50 to 21.00
New York, cupola (dealers)	17.50 to 18.00
Pittsburgh, cupola	22.50 to 23.00
San Francisco	25.00 to 26.00
St. Louis, agricultural	18.00 to 18.50
St. Louis, railroad	19.00 to 19.50
Valleys	22.00 to 22.50

HEAVY CAST

Boston (consumers)	$19.50 to 20.00
Buffalo	18.00 to 19.00
Cleveland	16.50 to 16.75
Eastern Pennsylvania	19.50 to 20.00
New York (dealers)	15.50 to 16.00
Pittsburgh	19.00 to 19.50

MALLEABLE

Boston (railroad)	$19.50 to 20.00
Buffalo	20.00 to 21.00
Chicago, railroad	23.00 to 23.50
Chicago, agricultural	23.00 to 23.50
Cincinnati, agricultural	17.00 to 18.00
Cincinnati, railroad	17.50 to 18.50
Cleveland, agricultural	18.50 to 19.00
Cleveland, railroad, nominal	20.00
Eastern Pennsylvania, railroad	19.00 to 20.00
Pittsburgh, railroad	21.00 to 21.50
Pittsburgh, agricultural	18.00 to 18.50
St. Louis, agricultural	19.50 to 20.00
St. Louis, railroad	19.50 to 20.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	$17.50 to 18.50
Boston (dealers)	15.50 to 16.00
Chicago	18.00 to 18.50
Cleveland	21.00 to 21.50
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	16.00 to 16.50
Pittsburgh district	21.00 to 22.00
St. Louis	17.50 to 18.00

LOCOMOTIVE TIRES

Chicago	$17.50 to 18.00
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$19.00 to 19.50
Eastern Pennsylvania	22.00 to 24.00
Pittsburgh	24.00 to 25.00

LOGEMANN

Double Ram Hydraulic

Scrap-Metal Presses

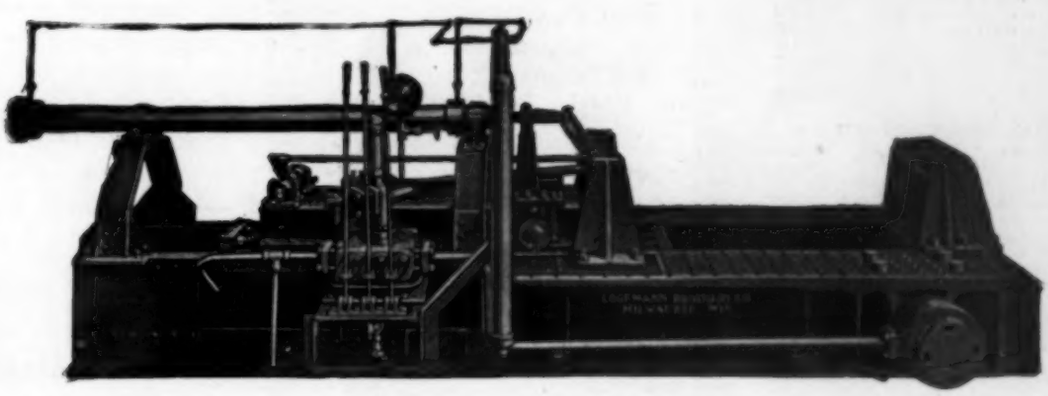
STANDARD

In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
Compare this with prices paid for "hydraulic-compressed."

LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



We build Balers for All Purposes

Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades.

Also Hydraulic Shaft Straighteners, Etc.

Composite Market Record

Monthly Averages of Fourteen Iron and Steel Products, 1913-1922, Compiled by The Iron Trade Review

1922	
Nov. 22	$41.78
Nov. 15	42.41
Nov. 8	42.72
Average for Oct.	43.60
Nov. 1	43.08
Oct. 25	43.42
Oct. 18	43.56
Oct. 11	43.88
Oct. 4	44.07
September	43.79
August	39.79
July	37.50
June	36.96
May	36.49
April	34.42
March	32.97
February	32.86
January	33.35
1921	
December	33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	48.81
January	$51.98
Average for year	40.74
1920	
December	54.04
November	63.75
October	68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year	65.59
1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year	50.32
1918	
December	$57.24
November	55.67
October	57.33
September	56.56
August	56.67
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year	56.68
1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year	70.10
1916	
December	$53.68
November	46.77
October	41.50
September	39.97
August	39.67
July	38.57
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year	40.50
1915	
December	31.56
November	28.64
October	26.19
September	25.55
August	24.77
July	24.25
June	23.74
May	22.89
April	22.66
March	22.71
February	22.21
January	21.90
Average for year	24.76
1914	
December	$21.58
November	23.39
October	22.84
September	23.17
August	22.72
July	22.17
June	22.58
May	22.99
April	23.39
March	23.60
February	23.52
January	23.03
Average for year	22.92
1913	
December	23.29
November	24.02
October	24.91
September	25.55
August	25.97
July	26.34
June	26.78
May	27.34
April	27.74
March	27.93
February	28.05
January	27.96
Average for year	26.32

Iron and Steel Statistics

Tin Plate Production

Year	Tin plate Tons	Terne plate Tons	Total Tons
1908	524,448	77,090	601,538
1909	589,929	95,465	685,394
1910	725,411	84,092	809,503
1911	798,814	79,221	878,035
1912	982,830	95,698	1,078,528
1913	854,093	68,472	922,565
1914	969,892	73,098	1,042,990
1915	1,100,913	81,735	1,182,648
1916	1,276,113	107,088	1,383,201
1917	1,616,658	76,946	1,693,604
1918	1,608,124	42,689	1,650,813
1919	1,203,579	85,427	1,289,006
1920	1,539,977	69,112	1,609,089
1921	837,660	50,721	888,381

Sheet Production

Year	Tons
1913	1,921,001
1914	1,668,644
1915	2,106,298
1916	2,492,794
1917	2,595,606
1918	2,176,537
1919	2,316,057
1920	3,133,217
1921	1,713,288

Plate Production

Year	Sheared Tons	Universal Tons	Total Tons
1913	1,844,354	1,158,416	3,002,770
1914	1,346,308	766,133	2,112,441
1915	1,923,199	954,852	2,878,051
1916	2,453,150	1,224,234	3,677,384
1917	2,963,039	1,195,199	4,158,238
1918	3,885,126	1,234,782	5,119,908
1919	2,899,967	992,054	3,892,021
1920	3,505,364	1,249,769	4,755,133
1921	1,189,714	570,610	1,760,324

Shape Production

Year	Gross tons
1908	1,083,181
1909	2,275,562
1910	2,266,890
1911	1,912,367
1912	2,846,487
1913	3,004,972
1914	2,031,124
1915	2,437,003
1916	3,029,964
1917	3,110,000
1918	2,849,969
1919	2,614,036
1920	3,306,748
1921	1,272,624

Bar Production

	Gross Tons		
Year	Iron Tons	Steel Tons	Total Tons
1908	685,233	1,301,405	1,986,638
1909	952,230	2,311,301	3,263,531
1910	1,074,163	2,711,568	3,785,731
1911	835,625	2,211,737	3,047,362
1912	944,790	2,752,324	3,697,114
1913	1,026,632	2,930,977	3,957,609
1914	563,171	1,960,460	2,523,631
1915	657,107	3,474,135	4,131,242
1916	993,948	5,236,354	6,230,302
1917	983,926	5,226,031	6,209,957
1918	846,898	5,395,851	6,242,749
1919	446,549	3,945,075	4,391,624
1920	663,032	5,467,208	6,130,240
1921	198,324	1,367,430	1,565,754

Tube Production

Year	Iron	Steel	Total
1913	276,067	1,969,465	2,245,532
1914	212,147	1,525,557	1,737,704
1915	206,513	1,713,161	1,919,674
1916	278,117	2,372,941	2,651,058
1917	273,890	2,213,087	2,486,977
1918	202,958	2,087,521	2,290,479
1919	162,356	2,212,575	2,374,931
1920	199,673	2,803,052	3,002,725
1921	110,293	1,877,149	1,987,442

Steel Rail Production

Year	Tons
1908	1,920,944
1909	3,023,845
1910	3,635,801
1911	2,822,556
1912	3,327,915
1913	3,502,780
1914	1,945,095
1915	2,204,203
1916	2,854,518
1917	2,944,161
1918	2,540,892
1919	2,203,843
1920	2,604,116
1921	2,178,818

Iron and Steel Freight Rates

Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.76
Newark, N. J.	6.05
Boston	6.55
Philadelphia	5.67
Pittsburgh	1.76
Chicago	4.79
St. Louis	5.80
Minneapolis, St. Paul	6.84
Buffalo to:	
Albany, N. Y.	$2.27
New England (rail)	4.91
New York and Brooklyn (rail)	4.91
Philadelphia	4.91
Rochester	1.39
Virginia furnaces to:	
Philadelphia	$5.17
New England	5.92
Brooklyn, Jersey City, Newark	5.54
Birmingham, Ala., to:	
Boston (rail)	$9.61
Boston (rail and water)	6.91
Cincinnati	4.05
Chicago	6.01
Cleveland	6.01
Louisville, Ky.	3.72
Minneapolis, St. Paul	8.76
New York	9.24
Jersey City, Newark	8.28
Philadelphia (rail)	7.80
Philadelphia (rail and water)	6.01
Pittsburgh	6.84
St. Louis	5.17
Seattle	20.16
Chicago to:	
Des Moines	$4.26
Minneapolis, St. Paul	3.04
Milwaukee	0.76
Moline, Ill.	1.77
Omaha	5.47
St. Louis	2.16
Ironton and Jackson, O., to:	
Chicago	$4.79
Cincinnati	2.27
Cleveland	3.02
Detroit	3.28
Indianapolis	2.90
Minneapolis, St. Paul	7.56

Finished Material

Pittsburgh, carloads, per 100 pounds, to:

New York	$0.34
Philadelphia	0.325
Baltimore	0.315
Boston	0.365
Buffalo	0.265
Cleveland	0.215
Cincinnati	0.295
Chicago	0.34
Detroit	0.295
Minneapolis and St. Paul	0.60
Kansas City	0.735
Denver	1.27
St. Louis	0.43
New Orleans	0.515
Birmingham	0.69
Pacific coast (all rail)	1.495
Pacific coast (tin plate)	1.20